

Regional Economic Impacts of Electric Drive Vehicles and Technologies: Case Study of the Greater Cleveland Area

1018578

Final Report, May 2009

Cosponsor
The Cleveland Foundation
1422 Euclid Ave., Suite 1300
Cleveland, OH 44115

Project Manager
R. Stuebi

EPRI Project Manager
M. Duvall

DISCLAIMER OF WARRANTIES AND LIMITATION OF LIABILITIES

THIS DOCUMENT WAS PREPARED BY THE ORGANIZATION(S) NAMED BELOW AS AN ACCOUNT OF WORK SPONSORED OR COSPONSORED BY THE ELECTRIC POWER RESEARCH INSTITUTE, INC. (EPRI). NEITHER EPRI, ANY MEMBER OF EPRI, ANY COSPONSOR, THE ORGANIZATION(S) BELOW, NOR ANY PERSON ACTING ON BEHALF OF ANY OF THEM:

(A) MAKES ANY WARRANTY OR REPRESENTATION WHATSOEVER, EXPRESS OR IMPLIED, (I) WITH RESPECT TO THE USE OF ANY INFORMATION, APPARATUS, METHOD, PROCESS, OR SIMILAR ITEM DISCLOSED IN THIS DOCUMENT, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, OR (II) THAT SUCH USE DOES NOT INFRINGE ON OR INTERFERE WITH PRIVATELY OWNED RIGHTS, INCLUDING ANY PARTY'S INTELLECTUAL PROPERTY, OR (III) THAT THIS DOCUMENT IS SUITABLE TO ANY PARTICULAR USER'S CIRCUMSTANCE; OR

(B) ASSUMES RESPONSIBILITY FOR ANY DAMAGES OR OTHER LIABILITY WHATSOEVER (INCLUDING ANY CONSEQUENTIAL DAMAGES, EVEN IF EPRI OR ANY EPRI REPRESENTATIVE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES) RESULTING FROM YOUR SELECTION OR USE OF THIS DOCUMENT OR ANY INFORMATION, APPARATUS, METHOD, PROCESS, OR SIMILAR ITEM DISCLOSED IN THIS DOCUMENT.

ORGANIZATION(S) THAT PREPARED THIS DOCUMENT

Energy and Environmental Research Associates, LLC

EDV Commercialization

The University of Toledo

Northeast Ohio Areawide Coordinating Agency (NOACA)

FirstEnergy Corp.

Electric Power Research Institute

NOTE

For further information about EPRI, call the EPRI Customer Assistance Center at 800.313.3774 or e-mail askepri@epri.com.

Electric Power Research Institute, EPRI, and TOGETHER...SHAPING THE FUTURE OF ELECTRICITY are registered service marks of the Electric Power Research Institute, Inc.

COPYRIGHT © 2009 ELECTRIC POWER RESEARCH INSTITUTE, INC. ALL RIGHTS RESERVED.

CITATIONS

This report was prepared by

Energy and Environmental Research Associates, LLC
2 Babcock Farms Lane
Pittsford, NY 14534

Principal Investigators
J. Winebrake
E. Green

EDV Commercialization
16928 Helene Lane
Morgan Hill, CA 95037

Principal Investigator
R. Graham

The University of Toledo
College of Business Administration MS 103
Toledo, Ohio 43606

Principal Investigators
M. Vonderembse
T. Ragu-Nathan

Northeast Ohio Areawide Coordinating Agency (NOACA), Fiscal Agent
1299 Superior Avenue
Cleveland, OH 44114

Principal Investigator
A. Wainright

FirstEnergy Corp.
76 S. Main St
Akron, OH 44308-1812

Principal Investigators

S. Briggs
E. Buzzelli
M. Jirousek
P. Kelly
H. Rosebrock
E. Shaw

Electric Power Research Institute
3420 Hillview Avenue
Palo Alto, CA 94304

Principal Investigators

M. Alexander
M. Duvall
E. Knipping

This report describes research sponsored by the Electric Power Research Institute (EPRI) and The Cleveland Foundation.

The report is a corporate document that should be cited in the literature in the following manner:

Regional Economic Impacts of Electric Drive Vehicles and Technologies: Case Study of the Greater Cleveland Area. EPRI, Palo Alto, CA, and The Cleveland Foundation, Cleveland, OH: 2009. 1018578.

PRODUCT DESCRIPTION

Plug-in hybrid electric vehicles (PHEVs), which combine desirable aspects of battery electric vehicles and hybrid electric vehicles, offer owners the advantages of increased fuel efficiency and lower annual fuel bills without concern for dead batteries, long recharge time, or limited range. This study examines the potential regional economic impacts due to increasing electric transportation in the Greater Cleveland Area (GCA). By applying regional input-output (RIO) analysis, the study determines the impact of shifting transportation energy demand from petroleum to electricity. Also explored are aspects of industrial development needed to support an electric transportation future. Finally, the study looks at the effects of on-road and off-road electric transportation options. The results of this study may be useful in supporting regional policies aimed at increasing the use of electric transportation technologies in metropolitan areas.

Results and Findings

PHEV and electric drive technologies (EDTs) offer economic and regional benefits, as these technologies displace expensive petroleum with cheaper electricity. Section 1 of this report introduces the purpose of the study and provides background information on electric drive vehicles and the GCA region. Section 2 presents Phase I analytical methods for determining petroleum displacement impacts from PHEV use, including PHEV scenarios, fuel demand shifts, and RIO analysis and results. Section 3 discusses Phase II of the study, which explores impacts from non-PHEV electric transportation technologies, RIO analysis, and results. Section 4 describes Phase III of the study, which documents industry growth impacts. The emphasis here is on Cleveland electric drive vehicle (EDV) development, regional economic impact multiplier (REIM) results, and total Phase III regional economic impact results, including jobs created in facility construction, production, and operation as well as the influx of research and development funding.

Challenges and Objective(s)

The purpose of this study is to quantify the regional economic benefits associated with increased market penetration of PHEVs, EDVs, and other EDTs in the GCA. The GCA case study includes the city of Cleveland and eight surrounding counties: Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, and Summit. This region contains over 2.9 million people living in 1.2 million households. The GCA is well suited for this analysis in several regards. First, all of the counties in the GCA are in non-attainment status under the Clean Air Act (CAA) National Ambient Air Quality Standards (NAAQS) for at least one criteria pollutant. Second, motor vehicles are responsible for the majority of criteria pollutant emissions in the GCA region. Third, the GCA has a relatively high number of vehicles per capita. Finally, the GCA could benefit from the increase in manufacturing and employment opportunities created by PHEVs, EDVs, and other EDTs.

Applications, Values, and Use

With petroleum prices at or above 2006 levels, significant regional economic benefits can be gained through the use of electric transportation technologies in the Cleveland region. The potential economic impacts are twofold. First, large-scale development and expansion of PHEV- and EDT-supporting industries is one potential path to recouping past losses and facilitating future gains in manufacturing sectors. Second, the use of PHEVs and EDTs by industry can reduce operating costs for business by reducing fuel costs, further supporting local economic development. In all, the effects of a shift from petroleum to electricity in the transportation sector could potentially generate tens of thousands of net new jobs in the Cleveland area and increase regional economic output by billions of dollars annually.

EPRI Perspective

In recent years, municipalities have enacted policies to encourage economic development and discourage environmental degradation—areas previously regulated at the state or federal level. As this study shows, the potential local economic impacts from PHEV and EDT use are substantial. In light of this report’s findings, policies that encourage PHEV and EDV use and industry development in the GCA could result in significant regional economic payback.

Approach

Investigators took an RIO approach to analysis. RIO is one of the most extensively employed techniques in studying and tracking the macro-level impacts due to shifts in expenditures within a regional economy. In Phases I and II of this study, investigators used RIO analysis to determine the regional employment and economic output impacts associated with fuel switching due to large-scale PHEV deployment. In particular, Phase I focuses on PHEVs while Phase II focuses on other mobile sources. In Phase III of the study, they relied on RIO analysis to determine the regional economic impacts of large-scale development of PHEV- and EDV-supporting industries and related employment gains.

For Phases I and II of this study, investigators identified three economic shifts that occur due to PHEV and EDT market penetration: 1) a decrease in demand for petroleum; 2) an increase in electricity demand; and 3) reduced fuel expenditures by consumers, the savings from which are spent in other sectors of the economy. For each of these categories, investigators quantified the total (direct, indirect, and induced) output and employment impacts associated each shift. The net impacts of all shifts demonstrate the expected overall economic impact of large-scale PHEV use.

Keywords

Plug-In Hybrid Electric Vehicle (PHEV)
Electric Drive Technology (EDT)
Electric Drive Vehicle (EDV)
Greater Cleveland Area (GCA)
Regional Input-Output (RIO) Analysis
Regional Economic Impacts
Transportation Sector

ABSTRACT

Given the economic, environmental, and energy security concerns associated with petroleum dependence, there has been renewed interest in the United States to introduce alternatives to conventional vehicles in the transportation sector. Of increasing interest are plug-in hybrid electric vehicles (PHEVs), which combine desirable aspects of battery electric vehicles and hybrid electric vehicles. This study analyzes the regional economic impacts associated with large-scale use of PHEVs and other electric drive vehicles and technologies in the Cleveland, Ohio, greater metropolitan region. Specifically, the study examines the regional economic impacts due to petroleum displacement, increased electricity demand, and annual fuel cost savings by consumers. By applying regional input-output analysis, the study quantifies the potential macroeconomic impacts of transportation fuel switching, assuming five different price scenarios and under two modeling approaches. Finally, the study analyzes the economic impacts associated with development of regional industries related to electric transportation market penetration.

This research demonstrates that with petroleum prices at or above 2006 levels, significant regional economic benefits can be gained through the use of electric transportation technologies in the Cleveland region. In addition, the study shows that targeted large-scale development of industries that support the transition to an electric transportation future could have tremendous economic benefits for the region. In all, the effects of a shift from petroleum to electricity in the transportation sector could potentially generate *tens of thousands of net new jobs* in the Cleveland area and increase regional economic output by *billions of dollars* annually.

TABLE OF ACRONYMS

BEV	Battery Electric Vehicle
CAA	Clean Air Act
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CSA	Combined Statistical Area
DOE	Department of Energy
EDT	Electric Drive Technology
EDV	Electric Drive Vehicle
EPA	U.S. Environmental Protection Agency
EV	Electric Vehicle
eVMT	Electric Vehicle Miles Traveled
GDP	Gross Domestic Product
GHG	Greenhouse Gas
HEV	Hybrid Electric Vehicle
HH	Household
ICEV	Internal Combustion Engine Vehicle
IMPLAN	IMpact Analysis for PLANning
I-O or I/O	Input-Output Analysis
kWh	Kilowatt Hour
MPG	Miles Per Gallon
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NO _x	Nitrogen Oxides
PM	Particulate Matter
PHEV	Plug-in Hybrid Electric Vehicle
REIM	Regional Economic Impact Multiplier
RIO	Regional Input-Output Analysis
SO ₂	Sulfur Dioxide
SO _x	Sulfur Oxides
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds

EXECUTIVE SUMMARY

Project Purpose

Given the economic, environmental and energy security concerns associated with petroleum dependence, there has been renewed interest in the US to introduce alternatives to conventional vehicles in the transportation sector. Of increasing interest are plug-in hybrid electric vehicles (PHEVs), which combine desirable aspects of battery electric vehicles (BEV) and hybrid electric vehicles (HEV). PHEVs can run in a highly-efficient all-electric mode using batteries recharged by the electric grid; like HEVs, PHEVs can also run on gasoline when on-board stored electricity is no longer sufficient to power the vehicle. Therefore, PHEV owners can take advantage of increased fuel efficiency without concerns of dead batteries, long recharge time, or limited range.

In addition to PHEVs, there exist potential for electrification of numerous off-road vehicles and technologies. Electric drive technologies (EDTs) include: truck stop electrification, off-road industrial vehicles, alternative marine power, electric transport refrigeration units, on-road battery electric vehicles, and lawn & garden equipment. EDTs and PHEVs offer economic benefits, as these technologies displace expensive petroleum with cheaper electricity and therefore provide fuel cost savings to owners. This in turn provides regional economic benefits since petroleum expenditures generally tend to leave a region (due to the high level of petroleum imports). Moreover electricity as a transportation fuel is cheaper than petroleum on a per mile basis. To illustrate, a gasoline passenger vehicle with a fuel economy of 24.1 miles/gallon costs \$0.104/mile at \$2.51/gallon, while a PHEV with an electric-mode fuel economy of 3.14 mile/kWh would cost \$0.029/mile at \$0.09/kWh.¹ Therefore use of PHEVs and EDTs can lower annual fuel bills, leaving consumers more disposable income with which to purchase other goods and services.

The potential regional economic impacts of PHEVs and EDTs are not limited to shifts in fuel savings. The large-scale market penetration of PHEVs and EDTs will require the development of industries to support the technologies, such as new vehicle production, battery manufacturing and recycling, infrastructure development, and research and development. Regions where such industries develop may see considerable gains in economic output. The increased industry activity and output will require labor, increasing employment and income in the region. Employees will spend their new earnings on local goods and services, further boosting the regional economy.

¹ Fuel economy estimates from EPRI/NRDC (2007), shown in Table 2-2 of this report; energy prices represent Cleveland area 2006 average prices, shown in Table 2-4 of this report. Cost per mile comparisons for a range of energy prices are shown in Table 2-4 and Figure 2-3.

This study quantifies regional economic impacts due to hypothetical PHEV and EDT market penetration and industry development using a case study of the Greater Cleveland Area (GCA), which includes the city of Cleveland and eight surrounding counties: Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage and Summit. This region contains over 2.9 million people living in 1.2 million households. Median household income for the region ranges from \$37,515 (Ashtabula County) to \$67,891 (Gauga County).² Several counties in the region are in non-attainment status under the Clean Air Act for at least one criteria pollutant; on-road and off-road vehicles are responsible for the majority of criteria pollutant emissions in the region.

Moreover, like many cities in the US, the Cleveland area has seen its manufacturing base erode in recent years. Regional employment in manufacturing has declined substantially since 2002; this is primarily due to Ohio's high concentration in traditional automotive industries which have faced intense competitive pressure. Given these pressures, finding ways to increase employment and output in manufacturing, and to reduce costs for these industries is crucial. The large-scale development of PHEV- and EDT- supporting industries is one potential path to recouping past losses and even facilitating future gains manufacturing sectors. As discussed above, the use of PHEVs and EDTs by industry can reduce operating costs for business, further supporting local economic development.

Section 1 of this report introduces the purpose of the study and provides background information on EDVs and the GCA region. In Section 2, we present our Phase I analytical methodology, including PHEV scenarios, fuel demand shifts, and regional input-output (RIO) analysis and results. In Section 3, we present our Phase II methodology and results. And finally, in Section 4, we present the Phase III methodology and results.

Methodology

We take a “regional input-output” (RIO) approach in conducting our analysis. RIO is one of the most extensively employed techniques in studying the macro-level impacts due to shifts in expenditures within a regional economy. RIO analysis allows us to track the economic impacts from shifts in economic activity within a regional economy.

RIO is valuable not only because it captures the direct impacts of such shifts (for example, a shift of household spending from gasoline to electricity), but it also captures the *indirect* and *induced* effects of these direct impacts. For example, the production of electricity involves fuel purchases, equipment purchases, labor, and maintenance services. RIO analysis allows one to capture the changes in demand for all these production inputs due to a change in demand for the final product.

In Phases I and II of this study, we use RIO analysis to determine the regional employment and economic output impacts associated with fuel switching due to large-scale PHEV deployment. In particular, Phase I focuses on PHEVs (LDV and HDV), while Phase II focuses on other mobile sources. In Phase III of the report, we use RIO to determine the regional economic impacts of

² These data are taken from the Economic Research Service of the U.S. Department of Agriculture; see www.ers.usda.gov for more information.

large-scale development of PHEV-and EDV-supporting industries and related employment gains.

For Phases I and II of this study, we identify three economic shifts that occur due to PHEV and EDT market penetration: (1) a decrease in demand for petroleum; (2) an increase in electricity demand; and, (3) reduced fuel expenditures by consumers, the savings from which are spent in other sectors of the economy. For each of these categories, we quantify the total (direct, indirect, and induced) output and employment impacts associated each shift. The net impacts of all shifts demonstrate the expected overall economic impact of large-scale PHEV use.

In Phase I, we examine the regional economic impacts in the CSA using a 2030 PHEV market penetration scenario developed in a recent report, *Environmental Assessment of Plug-In Hybrid Electric Vehicles, Volume 1: Nationwide Greenhouse Gas Emissions*. EPRI, Palo Alto, CA: 2007. 1015325, by EPRI and the Natural Resources Defense Council (NRDC). In Phase II, we examine two potential scenarios of EDT use in the GCA using *Expected* and *Achievable Scenarios* for the year 2020; these scenarios and fuel displacement estimates were developed in a companion report.

We examine five energy price cases in Phases I and II:

- Case I – 2006 electricity (\$0.090/kWh) and gasoline (\$2.51/gallon) prices.
- Case II – 2008 electricity (\$0.093/kWh) and gasoline (\$3.51/gallon) prices.
- Case III – Derived *low* US Department of Energy (DOE) 2030 national energy price projections (U.S. Department of Energy 2008) (\$0.086/kWh and \$1.76/gallon).
- Case IV – Derived *high* DOE 2030 national energy price projections (U.S. Department of Energy 2008) (\$0.092/kWh and \$3.37/gallon).
- Case V – Very high electricity prices (\$0.184/kWh) and Case IV gasoline prices (\$3.37/gallon).

We model each case under two scenarios. The first scenario (*Scenario A*) assumes that the regional gasoline displacement due to PHEV use negatively affects demand in all industries that support the region's gasoline markets (including gasoline stations, transportation of fuel, wholesale trade, and petroleum refineries). The second scenario (*Scenario B*) assumes that regional gasoline displacement due to PHEV use affects all inputs to retail gasoline markets with the exception of the petroleum refining industry, which continues to operate at its current capacity—presumably selling their refined products to other regions. We believe Scenario B offers a more likely scenario given forecasted increases in worldwide demand for petroleum products, but we include Scenario A as a “worst case” consideration.

For Phase III of this study, we identify estimated changes in regional economic activity and employment due to development and expansion of PHEV-and EDV-supporting industries. These impacts include jobs created in facility construction, production and operation, and the influx of research and development funding. Phase III includes two major sections.

First, we develop regional economic impact multipliers (REIMs) which quantify the total (direct, indirect, and induced) output, employment, and labor income impacts associated with

development in a number of PHEV and EDT related industries. The REIMs demonstrate expected economic impacts associated with job creation in each examined sector. Next, we examine a potential scenario of PHEV-and EDT-related industry growth and expansion developed in a companion report; this study estimated the number of potential jobs that could be generated in the Cleveland region due to the development and expansion of facilities and production in industries supporting PHEVs and EDTs. We use the REIMs to estimate the total regional economic impacts of such industry expansion.

Results

Phase I: PHEV Market Penetration Scenarios

The shifts in demand for gasoline, diesel, electricity, and household spending were quantified for light-duty vehicles (LDV) and heavy-duty vehicles (HDV) based on PHEV scenarios discussed in EPRI (2007). Table 1 presents the shifts in *physical quantity of each fuel demanded* in the GCA, by vehicle type. Table 2 presents the valuation of the demand shifts and of the related household savings, or “increased HH income”.

For each case *Employment* (jobs/yr) and *Output* (\$M 2006/yr) are calculated; LDV fleet results for all cases and scenarios are shown in Figures 1 and 2. Total impacts vary based on the case; however, *net employment impacts are positive for all cases, and net output impacts are positive in all cases with Scenario B assumptions*. Results show increased economic output up to \$1.4 Billion and increased employment of up to 10,500 jobs/yr due to LDV fuel displacement impacts; HDV-related fuel displacement impacts are estimated to increase regional economic output by up to \$121 M/yr and to increase employment by over 915 jobs/yr.

Clearly certain sectors of the economy will see greater relative increases in employment and output in response to fuel switching in the GCA. Of particular interest in a region such as Cleveland are potential positive impacts estimated for industrial and manufacturing sectors of the economy. Table 3 presents estimated output and employment impacts of Case I LDV fuel displacement for the top ten industry sectors. As shown in the table, power generation and supply, telecommunications, and pharmaceutical manufacturing industries will all see significant increases in employment and output.

Table 1
PHEV-Related Petroleum Displacement in GCA, LDV, HDV and Total

Vehicle Population	Household Fuel Consumption	Base Case Scenario	PHEV Scenario	Change in Demand
LDV	Gasoline (Million Gallons/year)	2,035.9	1,634.5	-401.4
	Diesel (Million Gallons/year)	5.6	4.6	-1.0
	Electricity (Million kWh/yr)	0	2,965.7	2,965.7
HDV	Gasoline (Million Gallons/year)	147.1	123.4	- 23.7
	Diesel (Million Gallons/year)	485.7	476.2	- 9.5
	Electricity (Million kWh/yr)	0	255.3	255.3

Table 2
Direct Change in Regional Household Fuel Expenditures (RIO Inputs for Each Impact), LDV and HDV

	Direct Impact	Direct Impact	Direct Impact	Direct Impact	Direct Impact
	Case I	Case II	Case III	Case IV	Case V
Impact	2006 (\$M/yr)	2008 (\$M/yr)	2030 Low (\$M/yr)	2030 High (\$M/yr)	VH Electricity (\$M/yr)
Light Duty Vehicles					
Reduced Petroleum Demand	-1,010.2	-1,413.0	-710.0	-1,358.3	-1,358.3
Increased Electricity Demand	266.9	275.8	254.9	272.9	545.8
Increased HH Income	743.3	1,137.2	455.1	1,085.4	812.5
Heavy Duty Vehicles					
Reduced Petroleum Demand	-84.9	-121.8	-59.7	-114.2	-114.2
Increased Electricity Demand	23.0	23.7	21.9	23.5	47.0
Increased HH Income	62.0	98.1	37.7	90.7	67.2

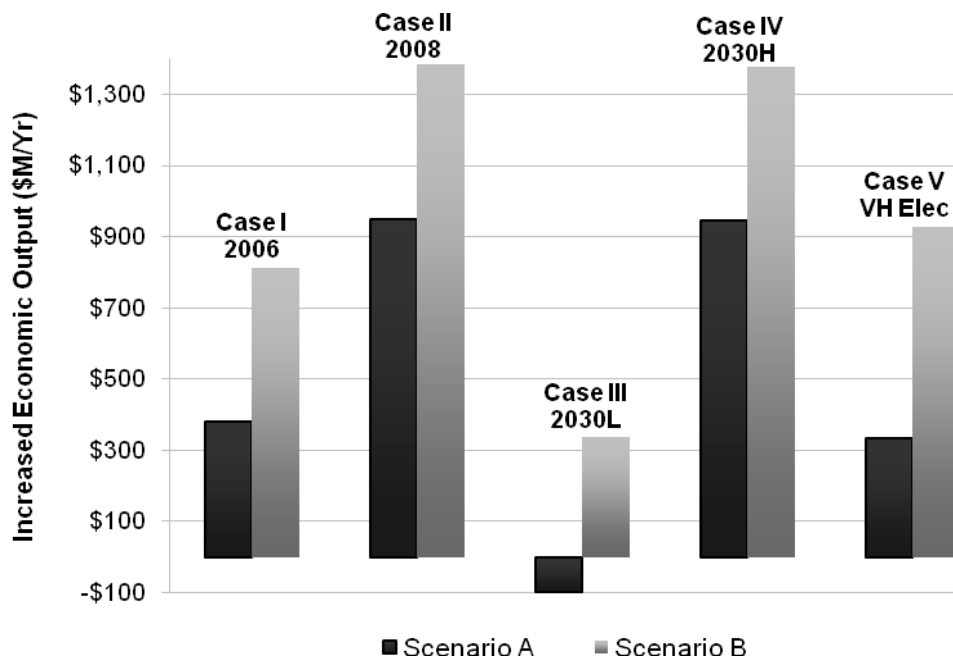


Figure 1
Phase I LDV Fleet Total Economic Output Impacts

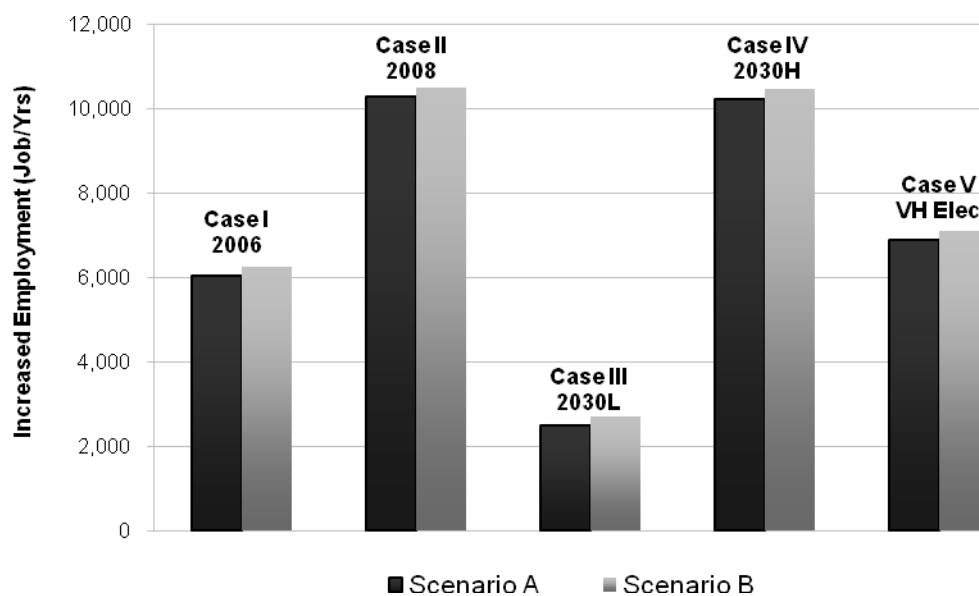


Figure 2
Phase I LDV Fleet Total Employment Impacts

Table 3
Case I PHEV LDV Fleet Scenario A Top Ten Impacted Industry Sectors (\$2006)

Case/ Scenario	Output		Employment	
	Industry/Sector	Output (\$M)	Industry/Sector	Jobs/yr
Case I Scenario A	Power generation and supply	\$ 181.0	Power generation and supply	353.6
	Telecommunications	\$ 12.1	Automotive repair and maintenance- except car wash	84.7
	Pharmaceutical and medicine manufacturing	\$ 10.6	Other maintenance and repair construction	39.2
	Oil and gas extraction	\$ 10.0	Telecommunications	35.6
	Automobile and light truck manufacturing	\$ 9.8	Architectural and engineering services	34.4
	Automotive repair and maintenance- except car wash	\$ 7.1	Oil and gas extraction	29.6
	Architectural and engineering services	\$ 4.0	Custom computer programming services	27.8
	Natural gas distribution	\$ 3.4	Other new construction	23.3
	Other maintenance and repair construction	\$ 2.6	Manufacturing and industrial buildings	14.6
	Maintenance and repair of nonresidential buildings	\$ 2.5	Pharmaceutical and medicine manufacturing	12.7
Case I Scenario B	Power generation and supply	\$ 181.4	Power generation and supply	354.4
	Oil and gas extraction	\$ 21.3	Automotive repair and maintenance- except car wash	86.2
	Telecommunications	\$ 12.4	Oil and gas extraction	62.8
	Pharmaceutical and medicine manufacturing	\$ 10.7	Other maintenance and repair construction	39.5
	Automobile and light truck manufacturing	\$ 10.0	Telecommunications	36.4
	Automotive repair and maintenance- except car wash	\$ 7.2	Other new construction	24.4
	Architectural and engineering services	\$ 4.6	Maintenance and repair of nonresidential buildings	21.4
	Petrochemical manufacturing	\$ 4.3	New residential additions and alterations- all	18.5
	Natural gas distribution	\$ 3.8	Bread and bakery product manufact	17.1
	Other maintenance and repair construction	\$ 2.7	Manufacturing and industrial buildings	15.3

Phase II: Non-PHEV Electric Technologies

Shifts in demand for gasoline, electricity, and household spending were quantified based on greenhouse gas emissions (GHG) reductions in EDT scenarios as developed and discussed in a companion report from the University of Toledo. Table 4 presents EDT technology- or application-specific estimated GHG reductions as well as shifts in *physical quantity of fuel demanded* for each fuel type, for an *Expected Scenario* and an *Achievable Scenario*. Table 5 presents the valuation of the demand shifts and of the related consumer savings, or “increased HH income”.

For each EDT penetration scenario, *Employment* (jobs/yr) and *Output* (\$M 2006/yr) are calculated, as shown in Tables 6 and 7. As with Phase I, total impacts vary based on the case; however, *net employment impacts are positive for all cases, and net output impacts are positive almost without exception*. Figure 3 and Figure 4 also show *Achievable Scenario* results for all cases and scenarios.

Phase III: EDT Industry Development Scenario

Direct creation of jobs in construction and production were estimated assuming an EDV-business development scenario as discussed in a companion report; Table 8 presents the direct job creation estimates by category—estimates are distinguished as construction (temporary) and production (permanent) positions. Table 8 also shows the estimated level of EDV-related research and development funding received by universities in the region.

Total regional economic impact multipliers (REIMs) are calculated for *Output* (\$/job), *Employment* (job/job), and *Labor Income* (\$/job), as shown in Table 9. REIMs for R&D investment are measured as *Output* (\$/\$), *Employment* (Jobs/\$M), and *Labor Income* (\$/\$). Results demonstrate that creation of jobs in EDV-related industries is associated with potentially significant regional economic impacts, though impacts vary considerably by sector.

Total regional economic impacts of increased employment and EDV industry development in the GCA region are calculated using the REIMs and EDV Commercialization job creation estimates. Impacts are reported for *Output* (millions of dollars, or \$M), *Employment* (jobs/yr), and *Labor Income* (\$M). Table 10 presents total (sum of direct, indirect and induced) impacts of the examined EDV industry development scenario in the GCA for 2020 in 2006 dollars.

Table 4
EDT Petroleum Displacement and Electricity Demand, Expected and Achievable Scenarios

Electric Drive Technology or Application	Expected Scenario EDT Fuel Displacement			Achievable Scenario EDT Fuel Displacement		
	GHG Reductions (Million Tons per year)	Gasoline/Diesel Replacement (gallons per year)	Increase in Electricity Consumption (KWh per year)	GHG Reductions (Million Tons per year)	Gasoline/Diesel Replacement (gallons per year)	Increase in Electricity Consumption (KWh per year)
Truck Stop Electrification	0.015	1,445,661	18,070,761	0.030	3,011,794	37,647,419
Off-Road Industrial Vehicles	0.019	1,867,312	23,341,400	0.176	17,468,403	218,355,033
Alternative Marine Power	0.010	963,774	12,047,174	0.052	5,120,049	64,000,613
Electric Transport Refrigeration Units	0.002	240,943	3,011,794	0.008	783,066	9,788,329
Other	0.001	60,236	752,948	0.014	1,385,425	17,317,813
Total Diesel Replacement	<i>0.046</i>	<i>4,577,926</i>	<i>57,224,078</i>	<i>0.280</i>	<i>27,768,737</i>	<i>347,109,207</i>
On-Road Battery Electric Vehicles	0.002	276,537	3,456,718	0.075	8,572,660	107,158,246
Lawn & Garden Equipment	0.000	-	-	0.024	2,696,240	33,702,997
Total Gasoline Replacement	<i>0</i>	<i>276,537</i>	<i>3,456,718</i>	<i>0.099</i>	<i>11,268,899</i>	<i>140,861,242</i>
Total Increase Electricity Demand	<i>60,680,795</i>			<i>487,970,449</i>		

Table 5
Direct Change in Regional EDT Fuel Expenditures, Expected and Achievable Scenarios

Impact	Direct Impact Case I 2006 (\$M/yr)	Direct Impact Case II 2008 (\$M/yr)	Direct Impact Case III 2030 Low (\$M/yr)	Direct Impact Case IV 2030 High (\$M/yr)	Direct Impact Case V VH Electricity (\$M/yr)
<i>Expected Scenario</i>					
Total Reduced Petroleum Demand	-12.9	-19.5	-9.1	-17.4	-17.4
• Reduced Gasoline Demand	-0.69	-0.97	-0.49	-0.93	-0.93
• Reduced Diesel Demand	-12.2	-18.6	-8.6	-16.4	-16.4
Increased Electricity Demand	5.5	5.6	5.2	5.6	11.2
Fuel Savings/Increased Income	7.5	13.9	3.9	11.8	6.2
<i>Achievable Scenario</i>					
Total Reduced Petroleum Demand	-102.4	-152.1	-72.0	-137.7	-137.7
• Reduced Gasoline Demand	-28.3	-39.6	-19.9	-38.0	-38.0
• Reduced Diesel Demand	-74.1	-112.6	52.1	-99.6	-99.6
Increased Electricity Demand	43.9	45.4	41.9	44.9	89.8
Fuel Savings/Increased Income	58.5	106.8	30.0	92.8	47.9

Table 6
Phase II Regional EDT (Non-PHEV) Economic Impacts, Expected Scenario, Cases I
through V (\$2006)

Case	Impact	Scenario A		Scenario B	
		Output (\$M/yr)	Employment (Jobs/yr)	Output (\$M/yr)	Employment (Jobs/yr)
Case I 2006 Prices	Decrease Petroleum	-\$11.16	-64.34	-\$11.16	-64.34
	Decrease Refining	-\$5.53	-2.91	n/a	n/a
	Increase Electricity	\$9.49	44.63	\$9.49	44.63
	Increase HH Income	\$12.29	91.41	\$12.29	91.41
	Total	\$5.09	68.79	\$10.62	71.70
Case II 2008 Prices	Decrease Petroleum	-\$11.16	-64.34	-\$11.16	-64.34
	Decrease Refining	-\$5.53	-2.91	n/a	n/a
	Increase Electricity	\$9.49	44.63	\$9.49	44.63
	Increase HH Income	\$21.95	163.20	\$21.95	163.20
	Total	\$14.74	140.58	\$20.27	143.49
Case III 2030 Low Prices	Decrease Petroleum	-\$11.16	-64.34	-\$11.16	-64.34
	Decrease Refining	-\$5.53	-2.91	n/a	n/a
	Increase Electricity	\$9.49	44.63	\$9.49	44.63
	Increase HH Income	\$6.37	47.34	\$6.37	47.34
	Total	-\$0.84	24.72	\$4.69	27.63
Case IV 2030 High Prices	Decrease Petroleum	-\$11.16	-64.34	-\$11.16	-64.34
	Decrease Refining	-\$5.53	-2.91	n/a	n/a
	Increase Electricity	\$9.49	44.63	\$9.49	44.63
	Increase HH Income	\$19.42	144.42	\$19.42	144.42
	Total	\$12.21	121.80	\$17.75	124.71
Case V 2030 Very High Electricity	Decrease Petroleum	-\$11.16	-64.34	-\$11.16	-64.34
	Decrease Refining	-\$5.53	-2.91	n/a	n/a
	Increase Electricity	\$9.49	44.63	\$9.49	44.63
	Increase HH Income	\$10.21	75.95	\$10.21	75.95
	Total	\$3.01	53.33	\$8.54	56.24

Table 7
Phase II Regional EDT (Non-PHEV) Economic Impacts, Achievable Scenario, Cases I through V

Case	Impact	Scenario A		Scenario B	
		Output (\$M/yr)	Employment (Jobs/yr)	Output (\$M/yr)	Employment (Jobs/yr)
Case I 2006 Prices	Decrease Petroleum	-\$88.60	-510.65	-\$88.60	-510.65
	Decrease Refining	-\$43.92	-23.09	n/a	n/a
	Increase Electricity	\$75.74	356.22	\$75.74	356.22
	Increase HH Income	\$96.47	717.43	\$96.47	717.43
	Total	\$39.70	539.91	\$83.61	563.00
Case II 2008 Prices	Decrease Petroleum	-\$88.60	-510.65	-\$88.60	-510.65
	Decrease Refining	-\$43.92	-23.09	n/a	n/a
	Increase Electricity	\$75.74	356.22	\$75.74	356.22
	Increase HH Income	\$168.68	1,254.40	\$168.68	1,254.40
	Total	\$111.91	1,076.88	\$155.83	1,099.97
Case III 2030 Low Prices	Decrease Petroleum	-\$88.60	-510.65	-\$88.60	-510.65
	Decrease Refining	-\$43.92	-23.09	n/a	n/a
	Increase Electricity	\$75.74	356.22	\$75.74	356.22
	Increase HH Income	\$49.53	368.31	\$49.53	368.31
	Total	-\$7.25	190.79	\$36.67	213.88
Case IV 2030 High Prices	Decrease Petroleum	-\$88.60	-510.65	-\$88.60	-510.65
	Decrease Refining	-\$43.92	-23.09	n/a	n/a
	Increase Electricity	\$75.74	356.22	\$75.74	356.22
	Increase HH Income	\$153.05	1,138.17	\$153.05	1,138.17
	Total	\$96.27	960.65	\$140.19	983.74
Case V 2030 Very High Electricity	Decrease Petroleum	-\$88.60	-510.65	-\$88.60	-510.65
	Decrease Refining	-\$43.92	-23.09	n/a	n/a
	Increase Electricity	\$75.74	356.22	\$75.74	356.22
	Increase HH Income	\$78.96	587.19	\$78.96	587.19
	Total	\$22.18	409.67	\$66.10	432.76

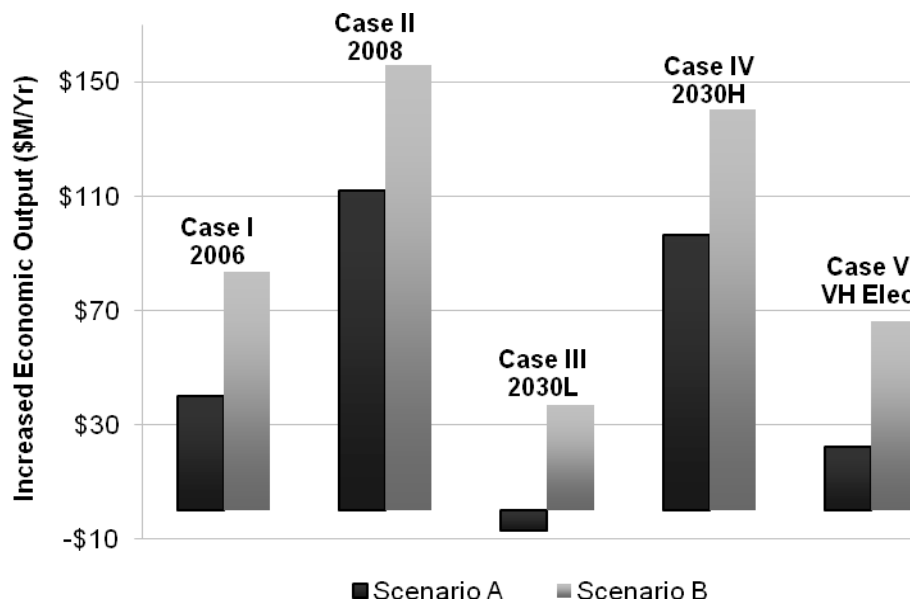


Figure 3
Phase II EDT (Non-PHEV) Anticipated Scenario Total Economic Output Impacts

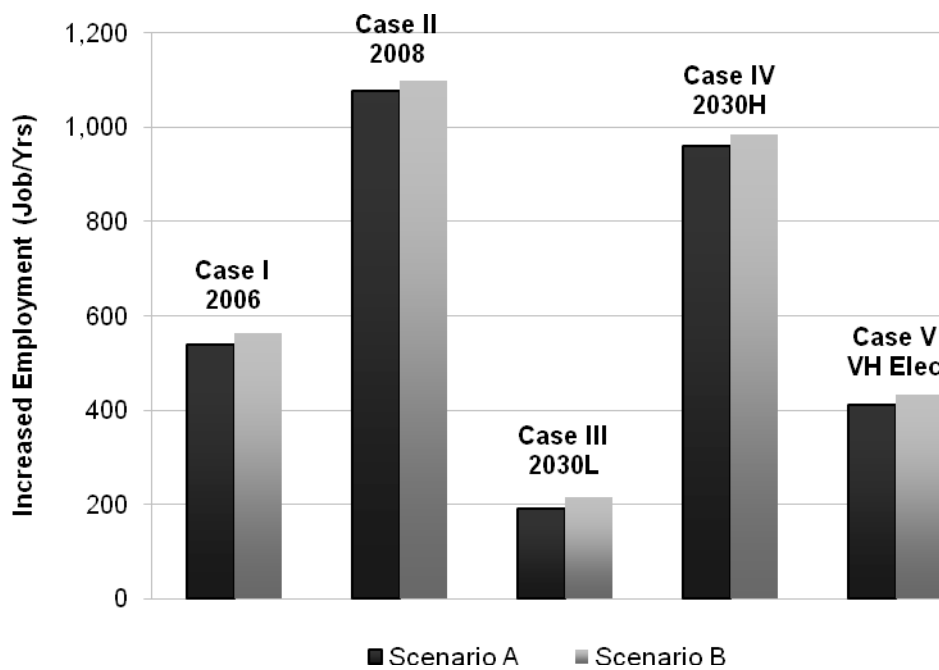


Figure 4
Phase II EDT (Non-PHEV) Anticipated Scenario Total Economic Output Impacts

Table 8
EDT Direct Employment and Economic Impacts of EDV Industry Growth in GCA

Category	R&D Funding over 10 years	Facility Construction Job Potential	Production Job Potential by 2020	Production Job Potential by 2030
<i>New Vehicle Production Plant*</i>				
Plant 1 - 1M Sq Ft		1000	3000	4000
Plant 2 - 750K Sq Ft		750	2250	3000
Plant 3 - 500K Sq Ft		500	1500	2000
Specialty Vehicle Plant Development**		600	2500	3000
<i>Battery Production and Recycling</i>				
Battery Plant		1200	500	600
Recycle Plant		600	1000	1200
<i>Auto Industry Suppliers (Parts)</i>			1138	2238
<i>Infrastructure System Supplier</i>			535	750
<i>Research and Development</i>	\$10M/yr		400	
*Modification to existing plant to support PHEV development; ** Special Electric Vehicle - BEV auto - 600K SqFt; Development *** 100M over 10 years 50% to Material Equipment/50% to Labor at \$150/hour				

Table 9
EDV Industry Employment Regional Economic Impact Multipliers for 2020 (\$2006)

EDV Industry/Sector	Output (\$/Job)	Employment (Job-Yrs/Job)	Labor Income (\$/Job)
All Construction (Vehicle, Battery Plant, etc)			
Facility Construction Jobs	172,645	1.8	77,018
New Vehicle Production Plant			
Automobile & Truck Manufacturing Jobs	2,249,919	6.9	397,642
Auto Industry Suppliers (Parts)			
Motor Vehicle Parts Manufacturing Jobs	628,445	3.1	175,553
Battery Production Plant			
Storage Battery Production Jobs	529,471	3.0	163,811
Battery Recycling Plant			
Recycle Plant (Waste Remediation) Jobs	335,168	2.5	113,237
Infrastructure System Supplier			
Power Generation & Supply Jobs	1,008,027	5.6	284,328
Power and Specialty Transformer Manufacture Jobs	434,574	2.6	117,876
Broadcast and Wireless Communication Equip	873,901	3.7	159,164
Other Communications Equipment Manufacture	599,822	3.3	154,164
Electric Component Manufacture	355,689	2.2	95,947
Research and Development	(\$/\$)	(Jobs/\$M)	(\$/\$)
\$ 1M Research & Development Services	2.145	19.0	.801
\$1M Colleges, Universities and Jr Colleges	2.151	26.7	.983

Table 10

Total Regional Economic Impacts, [EDV Commercialization] Scenario, 2006 Impacts, \$2006

	Number of Jobs	Output (\$M)	Employment (Jobs/yr)	Labor Income (\$M)
New Vehicle Production Plant Construction				
Plant 1 - 1M Sq Ft	1000	\$172.6	1,800.0	\$77.0
Plant 2 – 750k Sq Ft	750	\$129.5	1,350.0	\$57.8
Plant 3 - 500K Sq ft	500	\$86.3	900.0	\$38.5
Specialty Vehicle Plant Development**	600	\$103.5	1,080.0	\$46.2
New Vehicle Production Plant Construction Total	2,850	\$491.9	5,130.0	\$219.50
New Vehicle Production Plant				
Plant 1 - 1M Sq Ft	3000	\$6,749.8	20,700.0	\$1,192.9
Plant 2 – 750k Sq Ft	2250	\$5,062.3	15,525.0	\$894.7
Plant 3 - 500K Sq ft	1500	\$3,374.9	10,350.0	\$596.5
Specialty Vehicle Plant Development**	2500	\$5,624.8	17,250.0	\$994.1
Total New Vehicle Production Jobs	12,100	\$21,303.7	68,955.0	\$3,897.7
Motor Vehicle Parts Manufacturing Jobs (2006)	1138	\$715.2	3,527.8	\$199.8
Battery Production and Recycling Plant				
Battery Production Plant Construction Jobs	1200	\$207.2	2,160.0	\$92.4
Storage Battery Production Jobs	500	\$264.7	1,507.4	\$81.9
Battery Recycle Plant Construction Jobs	600	\$103.6	1,080.0	\$46.2
Recycle Plant (Waste Remediation) Jobs	1000	\$335.2	2,500.0	\$113.2
Total Battery Production and Recycling Plant	3300	\$910.7	7,247.4	\$333.7
Research and Development	\$ R&D	(\$M)	(Jobs)	(\$M)
\$ 5M Research & Development Services (2006)	\$5M	\$10.7	95.0	\$4.0
\$5M Colleges, Universities and Jr Colleges (2006)	\$5M	\$10.8	133.5	\$4.9
Total Research & Development	\$10M	\$21.5	228.5	\$8.9
Infrastructure System Supplier (Total Jobs)	535			
Power Generation & Supply	535	\$539.3	2,996.0	\$152.1
Power and Specialty Transformer Manufacture	535	\$232.5	1,391.0	\$63.1
Broadcast and Wireless Communication Equip	535	\$467.5	1,979.5	\$85.2
Other Communications Equipment Manufacture	535	\$320.9	1,765.5	\$82.5
Electric Component Manufacture	535	\$190.3	1,177.0	\$51.3
Total Infrastructure System Supplier (Range)		\$190.3- \$539.3	1,177.0 – 2,996.0	\$51.3 - \$152.1
Total Range		\$23,633 to 23,982	86,265.7 to 88,084.7	\$4,710.9 to \$4,811.7

Conclusions

Given the results of our analysis, we conclude that significant positive regional economic impacts will result in response to large-scale PHEV and EDV market penetration in the GCA. The development of PHEV and EDV supporting industries in the region has the potential to generate considerable positive economic impacts as well. Together, the economic impacts from fuel switching and industry development can lead to the creation of *tens of thousands of net new jobs* in the region and increased regional economic output in the *billions of dollars*. These results will inform local decision makers on the economic benefits that can be attained through large-scale deployment of PHEVs and EDTs in a region, as well as the economic benefits to regions capitalizing on PHEV and EDT industry development opportunities.

In recent years, municipalities have enacted policies to encourage economic development and discourage environmental degradation—areas previously regulated at the state or Federal level. As we have shown, the potential local economic impacts from PHEV and EDT use are substantial. In light of this report’s findings, policies that encourage PHEV and EDV use, and PHEV and EDV industry development in the GCA could have significant regional economic payback.

CONTENTS

1 INTRODUCTION	1-1
Purpose	1-1
Background	1-2
Plug-in Hybrid Electric Vehicles.....	1-2
The Greater Cleveland Study Area	1-4
2 PHASE I: PETROLEUM DISPLACEMENT IMPACTS FROM PHEV USE.....	2-1
Overview of Phase I	2-1
PHEV Scenarios and Data	2-2
Scenario Overview	2-2
Vehicle Miles Traveled	2-2
Vehicle Fuel Economy	2-2
Petroleum Displacement and Electricity Consumption Calculations	2-4
Valuation of Petroleum and Electricity Expenditures	2-5
Regional Input-Output Analysis.....	2-9
Input-Output Analysis Basics.....	2-9
Regional I-O Analysis	2-10
Structuring the RIO Model	2-11
Overview	2-11
Decrease in Petroleum Demand.....	2-11
Increase in Electricity Demand	2-12
Increase in Household Income	2-12
A Note on Incremental Costs of PHEVs and EDVs	2-12
Results	2-13
Direct Impacts.....	2-13
Regional Input-Output Analysis Results	2-14
Light Duty Vehicles	2-14
Heavy Duty Vehicles.....	2-14

Regional Industry-Specific Impacts	2-17
Conclusions.....	2-21
3 PHASE II: IMPACTS FROM NON-PHEV ELECTRIC TRANSPORTATION TECHNOLOGIES	3-1
Overview of Phase II	3-1
Other Electric Drive Technology Scenarios and Data	3-1
Scenario Overview	3-1
Valuation of Petroleum and Electricity Expenditures	3-3
Phase II Regional Input-Output Analysis.....	3-3
Decrease in Petroleum Demand	3-3
Increase in Electricity Demand	3-4
Increase in Income	3-4
Results	3-4
Direct Impacts.....	3-4
Regional Input-Output Analysis Results	3-5
Net Regional Impacts.....	3-5
Phase II Conclusions.....	3-9
4 PHASE III: INDUSTRY GROWTH IMPACTS	4-1
Overview of Phase III	4-1
Cleveland EDV Development Scenario.....	4-1
Scenario Overview	4-1
New Vehicle Production Plant.....	4-3
Battery Production and Recycling.....	4-3
Auto Industry Suppliers.....	4-4
Infrastructure System Suppliers.....	4-4
Research and Development	4-4
Conducting Regional Input-Output Analysis.....	4-4
Results	4-5
Regional Economic Impact Multiplier (REIM) Results	4-5
Facility and Plant Construction Jobs REIMs	4-7
Vehicle Production Jobs REIMs.....	4-7
Auto Industry Parts Suppliers REIMs.....	4-8
Battery Production Jobs REIMs	4-8

Battery Recycling Jobs REIMs.....	4-8
Infrastructure System Supplier REIMs.....	4-8
Research and Development REIMs.....	4-8
Total Phase III Regional Economic Impact Results.....	4-9
Phase III Conclusions.....	4-11
5 REFERENCES	5-1
A APPENDIX A: VEHICLE-CLASS AND COUNTY DATA	A-1
B APPENDIX B: EXAMPLE OUTPUT IMPACT REPORT	B-1
IMPACT: Cleveland Case IV Approach A Net Impacts	B-1
C APPENDIX C: EXAMPLE EMPLOYMENT IMPACTS	C-1
IMPACT: Cleveland Case IV Approach A Net Impacts	C-1
D APPENDIX D: PETROLEUM DEMAND BY HOUSEHOLD INCOME.....	D-1
E APPENDIX E: INDUSTRY-SPECIFIC ECONOMIC IMPACTS.....	E-1

LIST OF FIGURES

Figure 1-1 Map of PM-2.5 and 8-Hour Ozone Nonattainment Counties in United States.....	1-5
Figure 1-2 Map of Ohio Ozone Nonattainment Counties (GCA area in blue)	1-5
Figure 1-3 Map of Ohio PM-2.5 Nonattainment areas	1-6
Figure 2-1 Schematic Overview of Phase I Methodology	2-1
Figure 2-2 Cleveland Area Electricity and Gasoline Prices and Forecasts.....	2-8
Figure 2-3 Cleveland Electricity and Gasoline Prices, Cost per Mile Equivalent	2-8
Figure 2-4 Direct, Indirect and Induced Impacts of Increased Electricity Demand	2-10
Figure 2-5 Phase I PHEV Total Economic Output Impacts, LDV Fleet	2-16
Figure 2-6 Phase I PHEV Total Employment Impacts, LDV Fleet	2-16
Figure 3-1 Phase II Achievable Scenario Economic Output Impacts	3-8
Figure 3-2 Phase II Achievable Scenario Employment Impacts	3-8
Figure 4-1 Estimated Job Creation, EDV Industry Development Scenario.....	4-3
Figure 4-2 GCA EDV Industry Development Regional Economic Impact Multipliers.....	4-7

LIST OF TABLES

Table 2-1 PHEV Scenario Vehicle Miles Traveled, Total VMT and eVMT.....	2-3
Table 2-2 Vehicle Class Energy Consumption and Percent Electric VMT.....	2-4
Table 2-3 Change Petroleum and Electricity Demand in GCA, LDV, HDV and Total.....	2-6
Table 2-4 Energy Prices in Northeast Ohio Region in \$2006	2-7
Table 2-5 Direct Changes in Fuel Expenditures, LDV and HDV Fleets (\$2006)	2-13
Table 2-6 Phase I PHEV Regional Economic Impacts, Cases I through V, LDV Fleet (\$2006).....	2-15
Table 2-7 Phase I PHEV Regional Economic Impacts, Cases I through V, HDV Fleet (\$2006).....	2-18
Table 2-8 Case I PHEV LDV Fleet Scenario A Top Ten Impacted Industry Sectors*.....	2-19
Table 2-9 Case III LDV Fleet Scenario A Top Ten Impacted Industries	2-20
Table 3-1 Non-PHEV EDT Petroleum Displacement and Electricity Demand	3-2
Table 3-2 Direct Changes in EDT Fuel Expenditures	3-5
Table 3-3 Phase II Expected Scenario EDT (Non-PHEV) Regional Economic Impacts.....	3-6
Table 3-4 Phase II Achievable Scenario EDT (Non-PHEV) Regional Economic Impacts	3-7
Table 4-1 Direct Employment and Economic Impacts of EDV Industry Growth in GCA.....	4-2
Table 4-2 EDV Industry Employment REIM, 2020 Impacts in \$2006	4-6
Table 4-3 Total RIO Impacts (2006\$)	4-10
Table A-1 PHEV Scenario VMT and eVMT by County and Vehicle Class	A-1

1

INTRODUCTION

Purpose

The purpose of this study is to quantify the regional economic benefits associated with increased market penetration of plug-in hybrid electric vehicles (PHEVs), electric drive vehicles (EDVs), and other electric drive technologies (EDT) in a region. The potential economic impacts are twofold.

First, because PHEVs and EDTs use less petroleum and more electricity than conventional vehicles and technologies, consumers see a shift in expenditures from petroleum (most of which is imported) to electricity (most of which is produced locally). This shift, as well as the overall savings of fuel expenditures associated with using PHEVs and EDTs compared to conventional vehicles allows consumers to spend more of their income on local goods and services, thus generating potentially significant regional economic benefits.

Second, the large-scale market penetration of PHEVs and EDTs provides opportunities for growth in PHEV- and EDT-supporting industries such as vehicle production, battery manufacturing and recycling, infrastructure development and research and development. The development of these industries will directly increase local economic output, indirectly increase demand for local goods and services to support the developing industries, and require the creation of many jobs in construction and production.

To better understand this topic, we examine a case of the eight-county Cleveland, OH region (what we call the Greater Cleveland Area [GCA]). Our goals are: to estimate the economic impacts of large-scale PHEV penetration and electrification of on- and off-road technologies, concentrating on economic impacts due to the replacement of petroleum with electricity as energy in the household transportation sector; and, to estimate the economic impacts of development of PHEV and EDT-supporting industries in the region.

Other studies have examined the microeconomic and environmental benefits of electric vehicles using an engineering-economy approach (EPRI 2001), or have examined the macroeconomic impacts of increased electric vehicle penetration in the entire United States (Winebrake 2003). This project is distinct in that it takes into account the economic structure of the GCA region to calculate the expected economic and job impacts resulting from electrification of transportation and other technologies.

In Phase I and II of our study, we build upon several prior reports which examined the economic and environmental impacts of electric vehicle use in the five-county Cleveland, OH MSA (EPRI 2006)(EPRI and NRDC 2007). Integrating findings and approaches of the prior studies, this

work employs an analytical methodology which may be applied to quantify economic impacts of various transportation and equipment electrification scenarios in the GCA, and which may also be applied to other regions in the future.

Phase III of our study builds upon a companion report which estimated the potential expansion and development of PHEV and EDT-related industries in the GCA. The companion report estimated increased employment in several PHEV- and EDT-related sectors, including in construction of facilities, production jobs, and research and development. In this report, we use those findings to estimate the potential regional economic impacts of this increased employment.

Section 1 of this report introduces the purpose of the study and provides background information on EDVs and the GCA region. Sections 2, 3, and 4 present the methodology and results associated with Phases I, II, and III of the research, respectively.

Background

Plug-in Hybrid Electric Vehicles

Given the environmental, environmental, and energy security concerns associated with petroleum dependence, the US has renewed its interest in introducing alternatives to conventional vehicles in the transportation sector. A promising option is PHEVs, which combine desirable aspects of battery electric vehicles (BEV) and hybrid electric vehicles (HEV). PHEVs can run in a highly-efficient all-electric mode using batteries recharged by the electric grid; like HEVs, PHEVs can also run on gasoline when stored electricity is no longer sufficient to power the vehicle. Therefore, PHEV owners can take advantage of increased fuel efficiency without concerns of dead batteries, long recharge time, or limited range.

In contrast to other alternative fuel vehicles and HEVs, PHEVs can largely be “fueled” at the owner’s home (via the grid). Also PHEVs could be fueled by biofuels (mostly locally sourced) when in hybrid mode, increasing their petroleum-conserving component and further reducing their emissions. Because of their flexibility and beneficial characteristics, PHEVs have been described as the most promising alternative fuel vehicle option (Romm 2006).

Plug-in hybrid electric vehicles are associated with many potential environmental and economic benefits including: emissions reductions (tailpipe and total); improved efficiency over petroleum-fueled vehicles; petroleum displacement; lower fuel cost per mile, and broader economic impacts such as local investment and job growth. Other electric drive vehicles (EDVs) and electric drive technologies (EDTs) share the efficiency, emissions reductions, petroleum displacement, and lower fuel cost benefits of PHEVs.

Environmental concerns are a primary rationale for PHEV deployment. Compared to internal combustion engine vehicles (ICEVs) and petroleum-powered equipment, PHEVs have lower emissions of nitrogen oxides (NO_x), volatile organic compounds (VOCs), and fine particulate matter (PM_{2.5}) (EPRI and NRDC 2007). These pollutants are associated with negative health effects, property damage, and environmental degradation (U.S. Environmental Protection Agency 2006e). Use of electricity to power vehicles can reduce net emissions of greenhouse

gases (GHGs) including carbon dioxide (CO₂), which are associated with global climate change (Hackney and de Neufville 2001; Lindly and Haskew 2002). This is true even in regions where most electricity is produced by coal-fired power plants. Moreover, PHEVs and EDTs are particularly suited for use in cities and urban areas as they have little to no tailpipe fumes, depending upon their type and mode of use (Mierlo et al. 2006).

In addition to environmental advantages, PHEVs are on average far more efficient in comparison to diesel and gasoline-powered vehicles. According to US DOE's Office Transportation Technologies, electric vehicles (using electric motors and battery storage) are four times as efficient as ICEVs (U.S. Department of Energy 2002a). Due to their high efficiency and decreased reliance on petroleum fuel, PHEVs are particularly important for decreasing total petroleum consumption.

Of particular importance to the vehicle owner, electricity is a comparatively inexpensive operating fuel—in fact the per-vehicle mile cost of operating a vehicle on electricity is estimated to be about one-third the cost of operating on gasoline (Romm 2006). For instance (as illustrated in Table 2-4 and Figure 2-3), assuming 2006 prices a gasoline passenger vehicle with a fuel economy of 24.1 miles/gallon costs \$0.104/mile, while a PHEV with an electric-mode fuel economy of 3.14 mile/kWh would cost \$0.029/mile³. Therefore households making use of PHEVs and EDTs would experience far lower annual fuel bills. These household savings can be redirected towards other goods and services in the local economy, which then *multiply* through the economy, boosting regional economic activity and job growth.

The economic multiplier effect of petroleum displacement has been studied at a national level. For example, a 2002 U.S. Department of Energy (DOE) study estimated that if only 1% of small cars in the U.S. were electric vehicles in 2010, 24,000 barrels of oil per day would be displaced (U.S. Department of Energy 2002a). The economic benefits of this petroleum displacement were estimated to be \$1.46 billion (\$1999), far greater than the actual value of the oil itself. In addition, over 14,000 jobs were created due to this increase in economic activity (U.S. Department of Energy 2002a).

Another study found that with more substantial market penetration of electric vehicles, significantly more petroleum displacement and related economic growth would result. Examining a 2025 scenario where 50% of all U.S. vehicles were electric (and half of those vehicles were grid-connected PHEVs), the study found that petroleum consumption would be reduced by 4 million barrels per day—*1.5 billion* barrels each year—and GDP would increase by approximately *\$38.3 billion/year*. In addition, this level of PHEV market penetration would produce over 440,000 jobs in the U.S. by 2025 (Winebrake 2003).

A recent study examined the economic impacts of petroleum displacement due large-scale PHEV market penetration in six United States metropolitan regions (EPRI 2007). The study found that at 2007 petroleum and electricity prices, economic output in all six study regions would increase by hundreds of millions of dollars, and hundreds to thousands of jobs would be created in each region (EPRI 2007).

³ Fuel economy estimates from EPRI/NRDC (2007), shown in Table 2-2 of this report.

The Greater Cleveland Study Area

The purpose of this study is to identify the regional economic impacts due to large scale PHEV and EDT market penetration and industry development in GCA, which includes the city of Cleveland and eight surrounding counties: Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage and Summit. The GCA region had a combined 2006 population of over 2.9 million people living in 1.2 million households. Median household income for the region ranges from \$37,515 (Ashtabula County) to \$67,891 (Gauga County).⁴

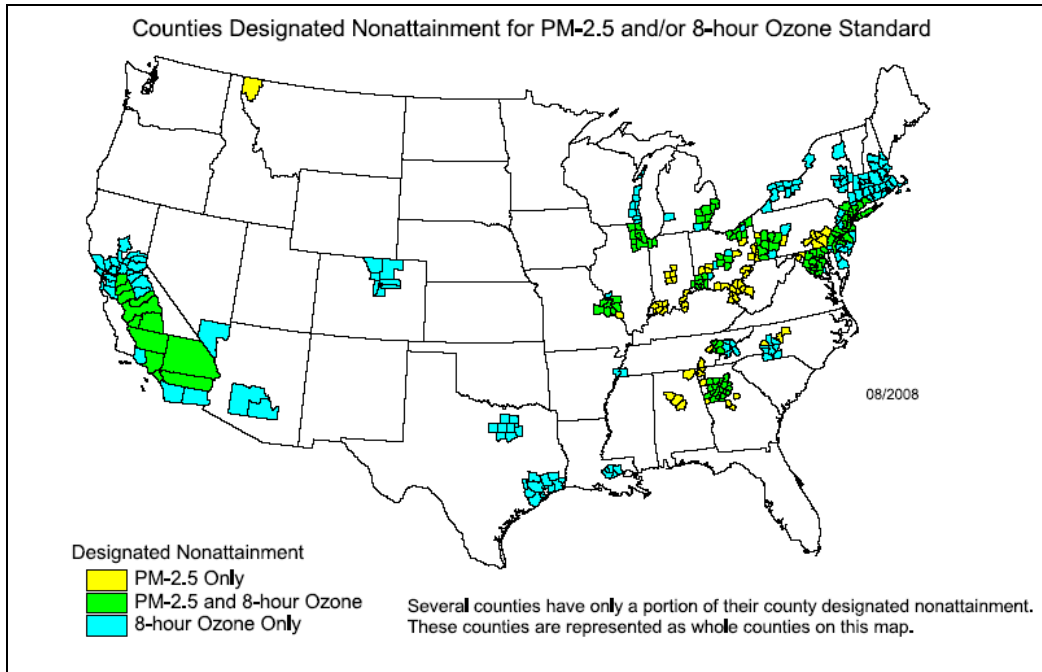
Cleveland is well suited for this analysis in several regards. First, all of the counties in the GCA are in non-attainment status under the Clean Air Act (CAA) National Ambient Air Quality Standards (NAAQS) for at least one criteria pollutant. As shown in Figures 1-1 through 1-3, in 2008 all or part of seven GCA counties were designated non-attainment for EPA's health-based standards for PM_{2.5}, and all eight counties were designated non-attainment for 8-hour ozone pollution (U.S. Environmental Protection Agency 2008a; U.S. EPA 2008b; U.S. Environmental Protection Agency 2008c)

Second, motor vehicles are responsible for the majority of criteria pollutant emissions in the GCA region. For instance, in Cuyahoga County, on- and off-road vehicles have produced over more than 50% of VOC emissions, 87% of NO_x emissions (VOC and NO_x are precursors to ozone), more than 95% of CO emissions and 10% of PM₁₀ emissions in recent years (U.S. Environmental Protection Agency 2006j).

Third, the GCA is also appropriate for this study since it has a relatively high number of vehicles per capita. In 2006, the population of the eight-county GCA region totaled 2,917,801 (IMPLAN 2008). The 2007 registered passenger vehicle population of the GCA was 2,061,819 (Ohio Department of Public Safety Information Technology Office 2008). With approximately 0.71 passenger vehicles per capita, the GCA average is significantly higher than the United States average of 0.45 passenger vehicles per capita.

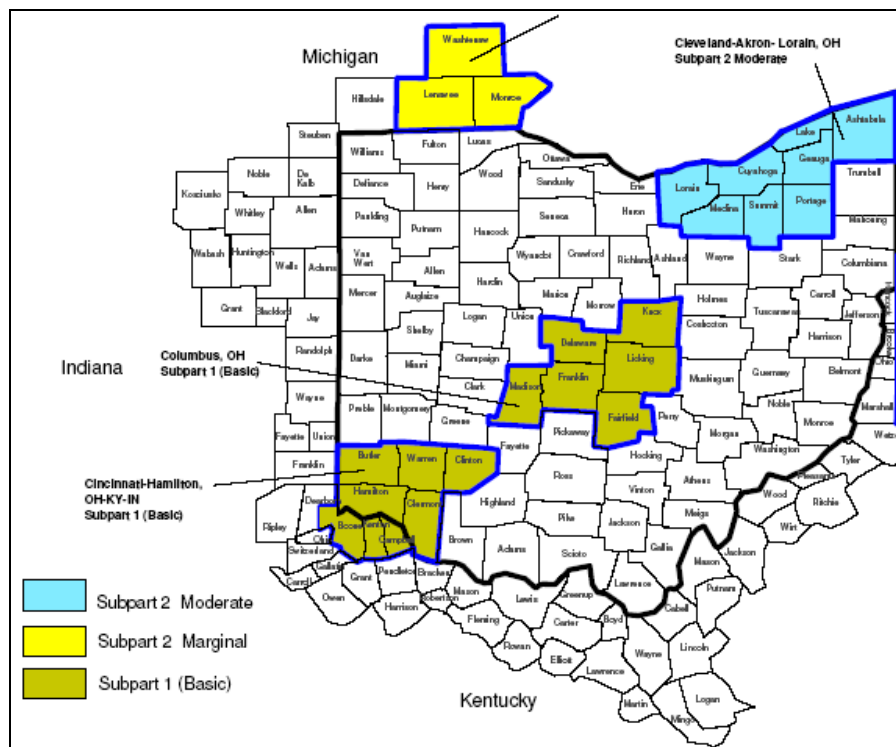
Lastly, we focus our efforts on Cleveland because like many cities in the U.S., the Cleveland area has seen its manufacturing base erode in recent years (Klein et al. 2005). In the GCA in particular, employment in manufacturing has declined substantially since 2002; this is primarily due to Ohio's high concentration in traditional automotive industries. Given the global competitive pressures that are causing manufacturing decline in such areas, finding ways to increase employment and output in manufacturing, and to reduce costs for these industries is crucial. The large-scale development and expansion of PHEV- and EDT- supporting industries is one potential path to recouping past losses and facilitate future gains in manufacturing sectors. Further, as discussed above, the use of PHEVs and EDTs by industry can reduce operating costs for business by reducing fuel costs, further supporting local economic development.

⁴ These data are taken from the Economic Research Service of the U.S. Department of Agriculture; see www.ers.usda.gov for more information.



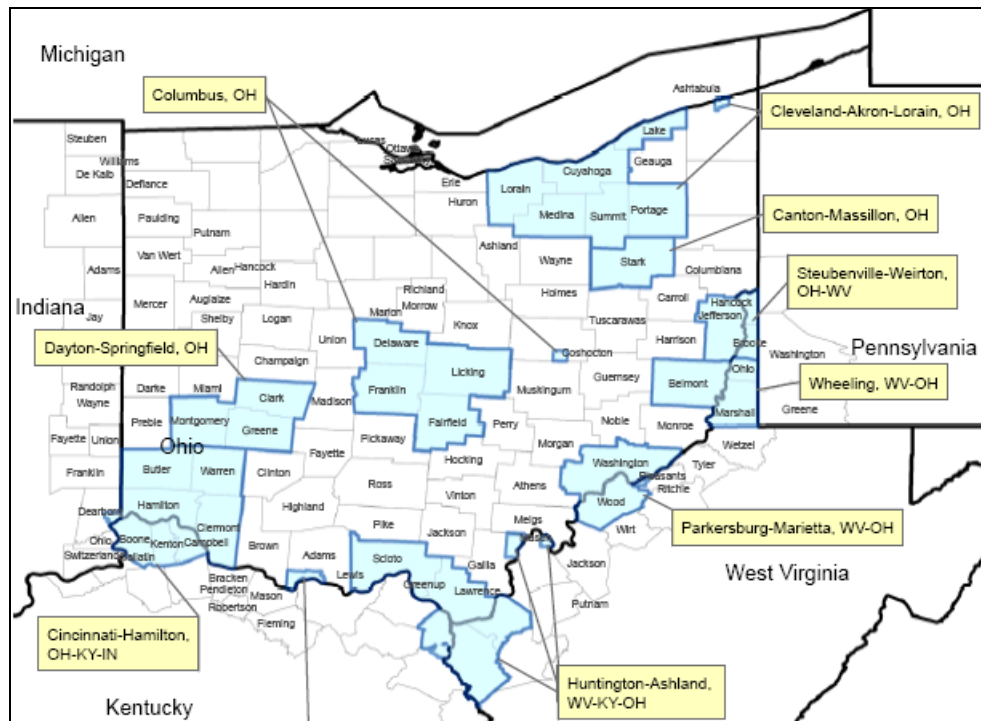
Source: (U.S. EPA 2008b)

Figure 1-1
Map of PM-2.5 and 8-Hour Ozone Nonattainment Counties in United States



Source: (U.S. Environmental Protection Agency 2008a)

Figure 1-2
Map of Ohio Ozone Nonattainment Counties (GCA area in blue)



Source: (U.S. Environmental Protection Agency 2008c)

Figure 1-3
Map of Ohio PM-2.5 Nonattainment areas

2

PHASE I: PETROLEUM DISPLACEMENT IMPACTS FROM PHEV USE

Overview of Phase I

The complete Phase I PHEV petroleum displacement valuation project involves two separate components, each with a series of steps depicted in Figure 2-1. Phase I of this report covers one major component: the identification of regional economic impacts due to petroleum displacement in the GCA. The steps covered in this report are depicted in the lower portion of Figure 2-1; these steps are discussed in more detail in the following sections. The steps depicted in the upper portion of the figure are discussed in more detail in an EPRI companion report (EPRI and NRDC 2007).

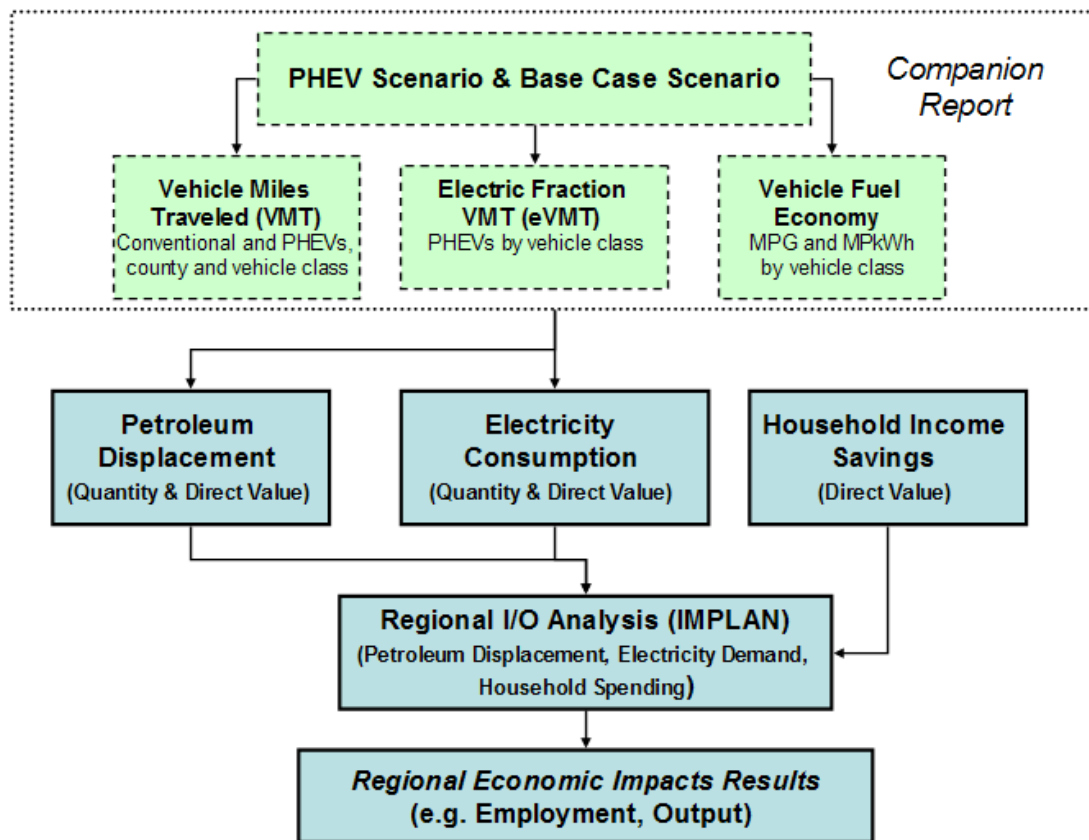


Figure 2-1
Schematic Overview of Phase I Methodology

PHEV Scenarios and Data

Scenario Overview

The level of regional economic impacts due to PHEV market penetration depends on three items: (1) the actual level of PHEV market penetration for the region, including the number and usage of PHEVs; (2) the amount of petroleum displaced with electricity according to PHEV usage, and (3) the relationships between changes in fuel demand and the regional economy.

We use PHEV scenarios developed by EPRI in a previous report, *Environmental Assessment of Plug-in Hybrid Electric Vehicles* (EPRI and NRDC 2007), in which a more detailed discussion of the scenario development methodology and study assumptions can be found. In the EPRI/NRDC study, two future scenarios for the year 2030 were developed and compared. In the *Base Case Scenario* no PHEV market penetration was assumed; in the *PHEV Scenario*, a high market penetration of PHEVs was assumed, with PHEVs comprising 40% of all on-road vehicles and 50% of all new vehicle sales. We use key variables from these scenarios—such as county- and class-specific vehicle miles traveled (VMT), all-electric fraction of VMT and vehicle fuel economy—to estimate changes in petroleum and electricity consumption, the central components of our economic analysis. The county-specific data used in our analysis is shown in Appendix A.

Vehicle Miles Traveled

The EPRI/NRDC study employed U.S. Environmental Protection Agency's (EPA) growth projections, and MOBILE6 model to estimate VMT by vehicle class for each county in the US under each scenario; VMT projections for each GCA county are shown in Table 2-1.

Though PHEVs were assumed to comprise 40% of the vehicle fleet, the all-electric portion of vehicle miles traveled (eVMT) was assumed to be considerably less than 40% of total VMT, as only once-daily charging was assumed, and occasional longer or overnight trips for which electric charging would be infeasible were assumed to occur. As shown in Table 2-1, eVMT comprises 19.9% of light-duty VMT in our study regions and 5.2% to 8.0% of heavy-duty VMT, for a total of 17.5% to 18.6% of VMT in the GCA.

Vehicle Fuel Economy

Vehicle fuel economy attributes are central in calculating total vehicle fuel consumption in a region. We use class-specific fuel economy attributes similar to those detailed in (EPRI and NRDC 2007), as shown in Table 2-2.

Table 2-1
PHEV Scenario Vehicle Miles Traveled, Total VMT and eVMT⁵

County	Light-duty VMT (Million Miles)	eVMT/ eFraction Light-duty VMT	Heavy-duty VMT (Million Miles)	eVMT/ eFraction Heavy-duty VMT	Total VMT (Millions)	eVMT/ eFraction Total VMT
	Light-Duty Vehicle Fleet		Heavy Duty Vehicle Fleet		Total Vehicle Fleet	
Ashtabula	1,575	314 / 19.9%	271	15 / 5.5%	1,852	329 / 17.8%
Cuyahoga	17,933	3,572 / 19.9%	1,945	155 / 8.0%	19,879	3,727 / 18.7%
Geauga	1,287	256 / 19.9%	241	13 / 5.2%	1,529	268 / 17.5%
Lake	2,821	562 / 19.9%	340	25 / 7.3%	3,161	587 / 18.6%
Lorain	3,666	730 / 19.9%	455	32 / 7.1%	4,121	762 / 18.5%
Medina	2,333	464 / 19.9%	389	22 / 5.7%	2,722	486 / 17.9%
Portage	2,561	509 / 19.9%	421	24 / 5.7%	2,983	533 / 17.9%
Summit	7,495	1,492 / 19.9%	885	66 / 7.4%	8,380	1,558 / 18.6%
Total Region	39,671	7,899 / 19.9%	4,947	352 / 7.1%	44,669	8,250 / 18.5%

⁵ Electric fraction of VMT by vehicle class available in Appendix A.

Table 2-2
Vehicle Class Energy Consumption and Percent Electric VMT

Individual Vehicle Class	Vehicle Class Name	GVWR (lb)	Base Case Scenario Fuel Economy (mpg)	PHEV Scenario Fuel Economy (mpg)	MOBILE6 Adjusted AC Electricity Consumption (Wh/m)	PHEV AC Consumption electric mode (mi/kWh)	Percent eVMT
LDGV	LD gasoline passenger vehicle	-	24.1	30.8	318.2	3.14	21.8%
LDGT12	LD gasoline truck, Class 1 & 2	0-6001	18.5	22.9	394.2	2.54	19.2%
LDGT34	LD gasoline truck, Class 3 & 4	6001-8500	14.2	17.3	493.2	2.03	17.9%
LDDV	LD diesel passenger vehicle	-	32.4	39.4	327.9	3.05	17.7%
LDDT	LD diesel truck	0-8500	17.4	21.4	460.0*	2.17	17.7%
HDDB	HD diesel bus	-	5.42	5.42	n/a	n/a	0.0%
HDDV2B	HD diesel Class 2b	8501-10000	12.96	15.75	680.2	1.47	17.7%
HDD345	HD diesel Class 3,4,5	10001-19500	10.65	12.72	768.7	1.30	16.4%
HDDV67	HD diesel Class 6,7	19501-33000	7.97	7.97	n/a	n/a	0.0%
HDDV8	HD diesel Class 8	33001+	6.37	6.37	n/a	n/a	0.0%
HDGV	HD gasoline vehicle	8500-19500	9.73	11.6	728.1	1.37	16.9%

*Two or more vehicle classes were aggregated to produce the LDDT vehicle class. For this class, average miles/kWh fuel economy of the aggregated classes is employed.

Petroleum Displacement and Electricity Consumption Calculations

Calculating petroleum displacement and electricity usage due to PHEV penetration involves translating *Base Case* and *PHEV Scenario* data into transportation petroleum and electricity demand estimates. We calculate changes in fuel demand for the GCA as follows:

- VMT_{ij} – Annual vehicle miles traveled by county (i) and vehicle class (j) (Appendix A, Table 2-1).
- $\% eVMT_{ij}$ – All-electric VMT fraction for PHEVs by county and class (Appendix A, Table 2-1, and Table 2-2).
- $MPG_{j,BC}$, $MPG_{j,PHEV}$ – Base Case and PHEV Scenario fuel economy in miles per gallon (mpg) by vehicle class for gasoline and diesel vehicles (Appendix A, Table 2-2).
- $MPkWh_{j,PHEV}$ – Miles per kilowatt-hour (kWh) for PHEVs by vehicle class (Table 2-2).

Based on the above, we calculate petroleum displacement (PD_{ij})⁶ between the *Base Case* and *PHEV* scenarios as:

$$PD_{ij} = \frac{VMT_{i,j}}{MPG_{j,BC}} - \frac{VMT_{i,j}}{MPG_{j,PHEV}}$$

Increase in electricity consumption (EC_{ij}) for the PHEV scenario is calculated as:

$$EC_{ij} = \frac{eVMT_{i,j}}{MPkWh_{j,PHEV}}$$

We calculate fuel displacement impacts of the light-duty vehicle (LDV) fleet and the heavy duty vehicle (HDV) fleet separately. Estimates by vehicle class for gasoline, diesel and electricity demand for the *Base Case Scenario* and *PHEV Scenario* are shown in Table 2-3, as is change in demand between the two scenarios.

Valuation of Petroleum and Electricity Expenditures

We value changes in demand for transportation fuels in order to determine the annual costs and savings attributable to PHEV use. We use GCA region-specific annual average retail price data from the U.S. Bureau of Labor Statistics (BLS) to value changes in demand for electricity and gasoline (U.S. Bureau of Labor Statistics 2008), and region-specific U.S. DOE Energy Information Administration (EIA) average retail price data for diesel (U.S. DOE 2008b). We also employ DOE Annual Energy Outlook projections for 2030 energy prices (U.S. Department of Energy 2008). Though heavy-duty vehicles are employed mostly by the industrial and commercial sectors, we use residential electricity rates to ensure a conservative estimate of fuel expenditure savings.

⁶ The equation is used to calculate both diesel and gasoline fuel displacement, though different VMT and MPG inputs are used according to differences in vehicle attributes and projections in vehicle activity among vehicle fuel types.

Table 2-3
Change Petroleum and Electricity Demand in GCA, LDV, HDV and Total

Vehicle Population	Household Fuel Consumption	Base Case Scenario	PHEV Scenario	Change in Demand
LDV	Gasoline (Million Gallons/year)	2,035.9	1,634.5	-401.4
	Diesel (Million Gallons/year)	5.6	4.6	-1.0
	Electricity (Million kWh/yr)	0	2,965.7	2,965.7
HDV	Gasoline (Million Gallons/year)	147.1	123.4	- 23.7
	Diesel (Million Gallons/year)	485.7	476.2	- 9.5
	Electricity (Million kWh/yr)	0	255.3	255.3
Total	Gasoline (Million Gallons/year)	2,183.0	1,757.9	- 425.2
	Diesel (Million Gallons/year)	491.3	480.8	- 10.5
	Electricity (Million kWh/yr)	0	3,221.1	3,221.1

Average petroleum and electricity prices in the GCA for the years 2006 and 2008, and high and low energy price forecasts for 2030 are shown in Table 2-4 and Figure 2-2. PHEV-related fuel expenditures and household income savings are directly dependent on petroleum and electricity prices, as these prices together determine ICEV and PHEV cost per mile and thus total annual fuel costs and savings; gasoline and electricity costs per mile are shown in Figure 2-3.

Considering a range in energy prices allows us to examine a range of possible local economic impacts due to PHEV-related fuel switching. We conduct five cases to explore different energy price scenarios, as shown in Table 2-4. The cases are as follows:

- **Case I** – In this case we assume 2006 electricity (\$.090/kWh) and gasoline (\$2.51/gallon) prices. This case could be considered as “base case” with regard to PHEV implementation value.
- **Case II** – In this case we assume 2008 electricity (\$.093/kWh) and gasoline (\$3.51/gallon) prices. This case could be considered indicative of PHEV implementation value if 2008 price structures persist.
- **Case III** – In this case we assume low DOE 2030 national energy price projections (U.S. Department of Energy 2008) to derive region-specific prices. The low energy price scenario projects a national average gasoline price of \$1.84 per gallon (\$2006), 30% lower than in 2006. Average national residential electricity price is projected to be 8.5 cents per kWh, 4.5% lower than in 2006. Assuming uniform percentage change in energy prices, we adjust 2006 Cleveland area energy prices accordingly to derive low 2030 estimates—8.6 cents/kWh and \$1.76/gallon. This case could be considered most indicative of PHEV implementation value in 2030 if petroleum prices were to decrease significantly in the coming decades.

- **Case IV** – In this case we assume high DOE 2030 national energy price projections (U.S. Department of Energy 2008) to derive region-specific prices as described above for Case III. The high energy price scenario projects a national average gasoline price of \$3.52 per gallon (\$2006), 34% higher than the average 2006 price but lower than 2008 average prices⁷. Average national residential electricity price is projected to increase to 9.1 cents per kWh, 2% higher than in 2006. Assuming uniform percentage change in energy prices, we adjust 2006 Cleveland area energy prices accordingly to derive high 2030 estimates—9.2 cents/kWh and \$3.37/gallon.
- **Case V** –In this case we assume very high electricity prices (18.4 cents/kWh—double the price/kWh calculated from DOE 2030 high energy price projections), and Case IV gasoline prices (slightly less than 2008 prices at \$3.37/gallon). This case could be considered indicative of PHEV implementation value if electricity prices were to increase substantially in the future in response to increased regulations, or any number of factors.

The changes in total energy expenditures give us the annual net household savings; case-specific changes in annual fuel expenditures and household income savings are shown in Table 2-5. Together these changes in fuel demand and household savings are employed in our regional input-output models to determine the overall impact on the regional economy.

Table 2-4
Energy Prices in Northeast Ohio Region in \$2006

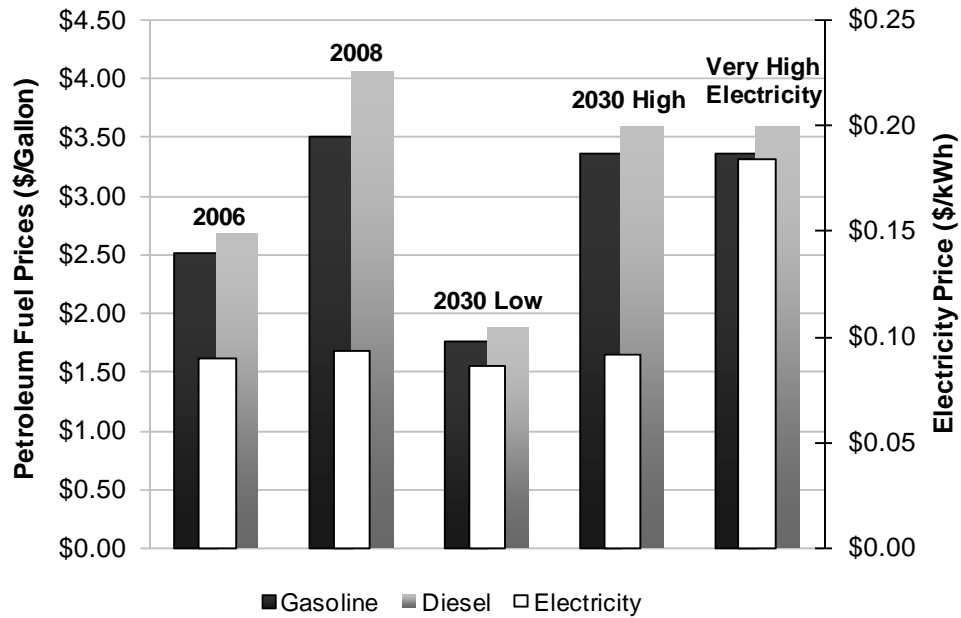
Case	Fuel Prices			Cost/Mile Equivalent	
	Gasoline (\$/gallon)	Diesel (\$/gallon)	Electricity (\$/kWh)	Gasoline (\$/mile) ⁸	Electricity (\$/mile) ⁹
Case I 2006 Prices	\$2.51	\$2.67	\$0.090	\$0.104	\$0.029
Case II 2008 Prices	\$3.51	\$4.05	\$0.093	\$0.146	\$0.030
Case III 2030 Low Prices	\$1.76	\$1.88	\$0.086	\$0.073	\$0.027
Case IV 2030 High Prices	\$3.37	\$3.59	\$0.092	\$0.140	\$0.029
Case V High Electricity	\$3.37	\$3.59	\$0.184	\$0.140	\$0.059

Source: (U.S. Bureau of Labor Statistics 2008; U.S. DOE EIA 2008; U.S. DOE 2008b)

⁷ January to July 2008 prices, the latest available at the time of the analysis.

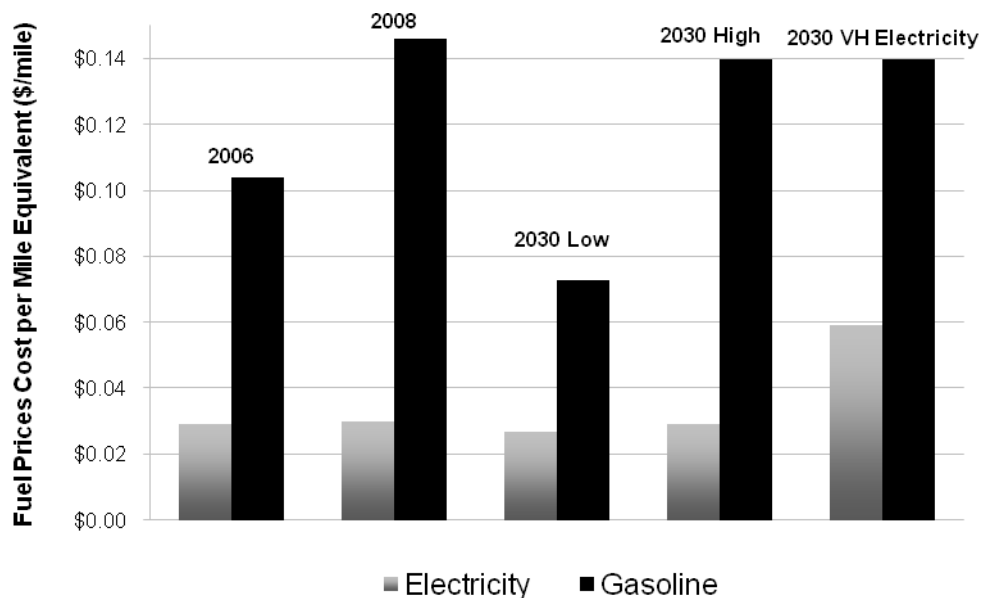
⁸ Assuming gasoline passenger vehicle with fuel economy of 24.1 miles/gallon

⁹ Assuming PHEV in all-electric mode with a fuel economy 3.1 miles/kWh



Source: (U.S. Bureau of Labor Statistics 2008; U.S. DOE EIA 2008; U.S. DOE 2008b)

Figure 2-2
Cleveland Area Electricity and Gasoline Prices and Forecasts



Source: (U.S. Bureau of Labor Statistics 2008; U.S. DOE EIA 2008; U.S. DOE 2008b)

Figure 2-3
Cleveland Electricity and Gasoline Prices, Cost per Mile Equivalent

Regional Input-Output Analysis

Input-Output Analysis Basics

We apply a regional input-output (RIO) analysis to determine the regional economic impact of PHEV penetration and related fuel shifts in the GCA region. RIO analysis is one of the most extensively employed techniques in studying the macroeconomic impacts due to shifts in expenditures within an economy. A complete description of the method is beyond the scope of this report; however, the reader is referred to other literature for more information about this technique (Miller and Blair 1985; Hawdon and Pearson 1995). Some of this literature is particularly aimed at the energy sector (Park 1982; Casler and Wilbur 1984; Wu and Chen 1990); and some work has applied input-output (I-O) analysis to understand the economic impacts of alternative fuel vehicle use (Fang 1998; U.S. Department of Energy 2001; U.S. Department of Energy 2002; Winebrake 2003). This section provides a brief overview of I-O and RIO and explains how it is used in this particular study.

Input-output analysis allows us to track economic impacts (such as employment and output) from shifts in economic activity within a regional or national economy. Relying on statistical data from the U.S. national accounting system, I-O analysis captures the many production-consumption linkages within the economy. For example, the production of electricity is no simple task—there are fuel purchases, equipment purchases, labor purchases, maintenance services, etc. that are involved in this production. I-O analysis allows one to assess the changes in demand for these production inputs due to a change in demand for the final product. I-O analyses are valuable not only because they capture the *direct* impacts of such shifts (for example, a shift of consumer spending from gasoline to electricity), but also because I-O evaluates the *indirect* and *induced* effects of these direct impacts.

In addition, the changes in demand for production inputs have their own set of production functions that I-O addresses. For instance an increase in final demand for electricity will create an increase in fuel purchases at the power plant, which in turn trigger increases in the inputs associated with fuel production such as mining services, fuel delivery, and fuel extraction equipment, as shown in Figure 2-4. These impacts are all considered “indirect” impacts in I-O analysis.

Finally, I-O captures “induced” economic effects. With any shift in final demand (and related shifts in production inputs) there will be shifts in household income. For example, increasing electricity demand may lead to increased labor requirements at the power plant, which implies additional dollars in take-home pay for new or existing electric utility employees. As shown in Figure 2-4, these employees will have increased household income and will spend it accordingly, thereby inducing higher economic activity within the regional economy. Along with the indirect effects mentioned above, these induced effects are included in our analysis.

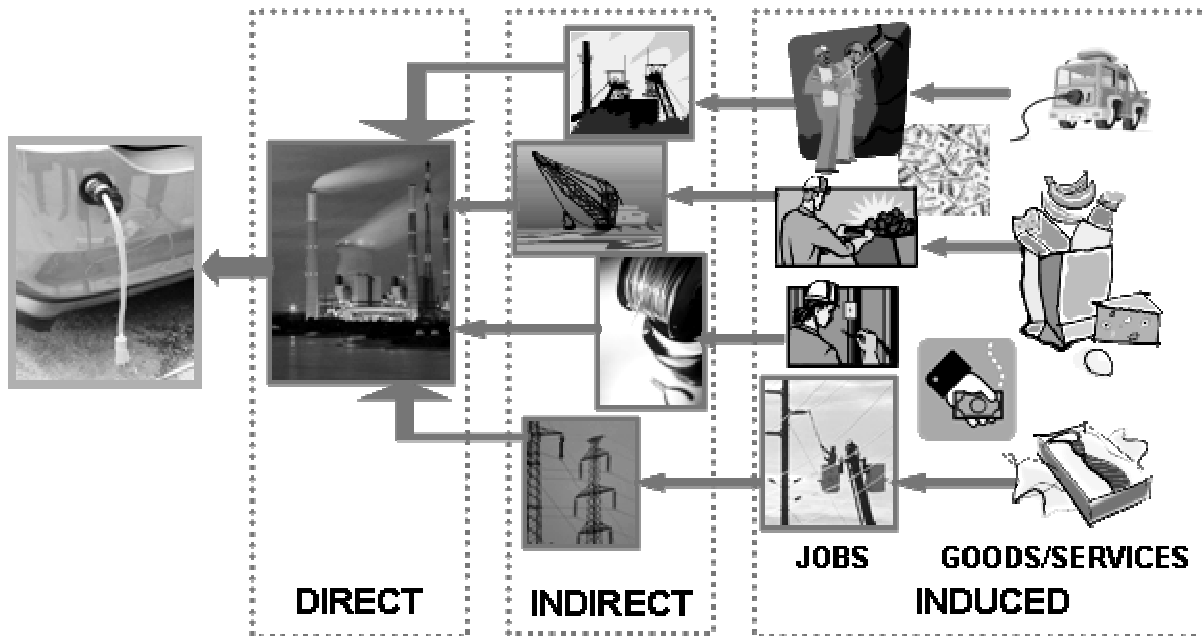


Figure 2-4
Direct, Indirect and Induced Impacts of Increased Electricity Demand

Regional I-O Analysis

Regional I-O analysis is I-O analysis for a particular region. In order to conduct these analyses, national accounting data tables must be restructured to account for the economic activity and production function attributes that occur *within the region under study*. We rely on economic activity data specific to the eight-county Greater Cleveland region, also known as the “Cleveland-Akron-Elyria Combined Statistical Area” (CSA), as Combined Statistical Areas are of a commonly accepted scale for RIO analyses. Our analyses address the direct, indirect, and induced economic impacts occurring within the GCA region due to petroleum displacement in response to large-scale PHEV use.

The mathematics of RIO analysis are beyond the scope of this report and are quite complicated. To assist in our analysis, we use the IMPLAN (IMPact Analysis for PLANning) Professional software analysis tool (Version 2.0). We obtained the most recent economic structural matrices and county data files (representing the year 2006) for each GCA county to construct our model. From our RIO analysis, we can determine regional economic impacts of the following two key parameters:

- **Output**, which is measured in \$/year and represents the value of economic activity in the region (by industry and in total) (Minnesota IMPLAN Group Inc. 2004).
- **Employment**, which is measured in job/years. Employment includes wage and salary employees, and self-employed jobs.

Appendix B and Appendix C present examples of the detailed sector-level impact analysis for output and employment, respectively.

Structuring the RIO Model

Overview

The main challenge of RIO analysis is translating a particular event or activity (e.g., increased PHEV market penetration) into changes in final demand for products, services, or investments. Petroleum displacement from PHEVs implies a real shift of spending patterns in a given region. In particular, consumers will spend less on gasoline and diesel and more on electricity in a future that involves large numbers of PHEVs. Since electricity is less expensive than gasoline per mile, PHEV consumers will also save money, freeing up resources for other purchases.

We use our model to calculate petroleum displacement *employment* (jobs/yr) and *economic output* (\$M/yr) impacts, based on assessments of the following:

- Regional economic impacts from a *decrease* in petroleum demand;
- Regional economic impacts of an *increase* in electricity demand; and,
- Regional economic impacts of an *increase* in household income (in response to decreased fuel expenses).

Each of these impacts is discussed in more detail below.

Decrease in Petroleum Demand

RIO analysis assumes that a decrease in demand for a good (output) also decreases demand for all industries contributing to the good's production (inputs). Therefore, reductions in retail gasoline demand at a local level would also affect all the "upstream" (i.e., fuel processing and refining) inputs needed to meet that demand. However, we think this assumption is too restrictive for the local petroleum markets we consider. In particular, we believe that increasing worldwide demand for petroleum products will mean that "upstream" petroleum industries will continue to maintain their productive capacities, even if retail gasoline sales in the region slide.

Therefore, we model each case under two scenarios. The first scenario (Scenario A) assumes that the regional gasoline displacement due to PHEV use affects demand in all industries that support a region's gasoline markets (including gasoline stations, transportation of fuel, wholesale trade, and petroleum refineries). In modeling Scenario A, we reduce demand for gasoline and diesel and all supporting input industries.

The second scenario (Scenario B) assumes that regional gasoline displacement due to PHEV use affects all Scenario A inputs to retail gasoline markets with the exception of the petroleum refining industry, which continues to operate at its current capacity (presumably selling their refined products to other regions). We believe Scenario B offers a more likely scenario given the increasing worldwide demand for petroleum products, but we include Scenario A as a "worst case" consideration. Therefore, we have a total of five cases (I, II, III, IV, V) and two scenarios (A, B), leading to a total of ten separate analyses for each vehicle class. Case-specific dollar values for decreases in petroleum are shown in Table 2-5 of the results section.

Increase in Electricity Demand

To model impacts of electricity demanded in each region, we calculate the value of increased electricity purchases by households due to PHEV use, and increase the corresponding demand for the power generation sector. Case-specific dollar values for increases in electricity demand are shown in Table 2-5 of the results section.

Increase in Household Income

Household fuel cost savings are calculated by subtracting increased electricity costs from petroleum savings. To model economic impacts of household fuel savings, we allocate savings as increases in income. We use an income-weighted approach that allocates savings across nine household income brackets according to each bracket's respective portion of petroleum consumption; we then allocate income according to the bracket-specific consumption functions of goods and services for the region. See Appendix D for household income bracket petroleum consumption figures. Case-specific increases in household income are shown in Table 2-5.

We note that HDVs are primarily employed by commercial and industrial sectors, and thus any fuel cost savings would be realized by the businesses and industries employing PHEVs. However, as we cannot estimate the level of PHEV use by specific industrial sectors, we cannot accurately model fuel costs savings in this manner. Therefore, for HDVs we assume that any fuel cost savings are passed onto households in the form of increased wages. In the end, as shown in Table 2-5, the impacts of HDVs are less than 10% of the LDV impacts.

A Note on Incremental Costs of PHEVs and EDVs

It is commonly accepted that PHEVs and other EDVs are more expensive than their equivalent internal combustion counterparts—that there are incremental costs associated with the purchase of PHEVs and EDVs. One could argue that incremental costs are needed to accurately assess the economic impacts of changes in household income and consumer spending in a region. Although we do not dismiss the importance of understanding capital expenditures by households, there is much uncertainty as to how “incremental costs” should be calculated. Some recent thinking suggests that consumers do not make choices between directly comparable alternative fueled and conventional vehicles, but rather choose across many vehicle types based on a complex analysis of many different vehicle attributes (and the consumer's budget for vehicle purchase). This implies that the traditional thinking about “incremental costs” (whereby the decision alternatives are constrained to include only a conventional vehicle and an alternative fuel vehicle of the same make/model) is somewhat limiting and perhaps even misleading. Consumer decision making is much more complicated, and monetizing the difference between the choice of a PHEV and the choice of a conventional vehicle is a very complicated (and uncertain) problem. Therefore, we do not include incremental cost impacts in this study, but reserve that analysis for future work.

Results

Direct Impacts

Table 2-5 shows the direct regional changes in household transportation fuel expenditures for each examined case. As shown in Table 2-5, large-scale implementation of PHEVs implies a significant shift of spending patterns for the Cleveland region. Household consumers will spend less on petroleum fuel, will spend more on electricity, and will realize considerable annual fuel expenditure savings, referred to here as “increased HH income”.

Table 2-5
Direct Changes in Fuel Expenditures, LDV and HDV Fleets (\$2006)

	Direct Impact	Direct Impact	Direct Impact	Direct Impact	Direct Impact
	Case I	Case II	Case III	Case IV	Case V
Impact	2006 (\$M/yr)	2008 (\$M/yr)	2030 Low (\$M/yr)	2030 High (\$M/yr)	VH Electricity (\$M/yr)
Light Duty Vehicles					
Reduced Petroleum Demand	-1,010.2	-1,413.0	-710.0	-1,358.3	-1,358.3
Increased Electricity Demand	266.9	275.8	254.9	272.9	545.8
Increased HH Income	743.3	1,137.2	455.1	1,085.4	812.5
Heavy Duty Vehicles					
Reduced Petroleum Demand	-84.9	-121.8	-59.7	-114.2	-114.2
Increased Electricity Demand	23.0	23.7	21.9	23.5	47.0
Increased HH Income	62.0	98.1	37.7	90.7	67.2

In this analysis, the Cleveland region would experience considerable reductions in total annual household petroleum expenditures, ranging from 710.0 \$M/yr in Case III to over \$1.4 *billion*/yr in Case II. Electricity expenditures will increase from 254.9 \$M/yr in Case III to 275.8 \$M/yr in Case II. As electricity is less expensive per mile as a transportation fuel, the increased electricity expenditures are a fraction of the petroleum fuel savings.

Also shown in Table 2-5 is the shift in transportation fuel spending, which results in large collective household savings in the GCA. Total household fuel savings (or “increased HH income”) ranges from 455.1 \$M/yr in Case III to over 1.1 \$B/yr in Case II. The value of increased HH income is truly significant: for instance, Case II savings represent \$938 annually

for every 2006 household¹⁰ in the GCA. These savings can be spent on any number of alternative goods and services, increasing local output and creating jobs.

Table 2-5 illustrates that large scale use of PHEVs will have substantial direct fuel demand impacts in the region. These direct demand changes are linked with numerous indirect and induced effects; these total economic impacts are presented in the following section.

Regional Input-Output Analysis Results

Light Duty Vehicles

Table 2-6, Figure 2-5 and Figure 2-6 show economic output results for LDVs, Cases I through V. As shown in the table and figures, the impacts of shifts in transportation fuel expenditures vary considerably depending on energy prices and scenario, though impacts are positive almost without exception.

Given 2006 energy prices and Scenario A assumptions, our analysis indicates net positive economic impacts of PHEV-related fuel switching in the region. As shown in the table and figures, total economic output increases by \$379.5 million (M)/yr output. Total employment in Greater Cleveland increases by 6,020 jobs/yr. Given Scenario B assumptions with 2006 prices, our analysis indicates even greater positive impacts of fuel switching in the GCA, with output increasing by \$812.7 million/yr and employment increasing by 6,248 jobs/yr.

Case II assumes 2008 energy prices; results are reported in 2006 dollars for consistency and comparison of Cases. Given 2008 energy prices and Scenario A assumptions, our analysis indicates considerable net positive economic impacts of PHEV-related fuel switching in the GCA: total economic output increases by \$949.8 M/yr with 10,261.3 jobs/yr created. Given Scenario B assumptions and 2008 energy prices, our analysis indicates even greater positive economic impacts, with total economic output increasing by \$1.38 *billion (B)*/yr and nearly 10,500 jobs/yr created. Similar benefits for the LDV sector are shown in the remainder of the table.

Heavy Duty Vehicles

Table 2-7 shows economic output results for HDVs, Cases I through V. As with LDVs, the impacts of shifts in transportation fuel expenditures vary depending on energy prices and Scenario, though impacts are positive almost without exception. As estimated fuel displacement in the HDV fleet is a fraction of that estimated for LDVs, the net regional economic impacts of HDV PHEVs are less considerable than those estimated for LDVs.

¹⁰ In 2006, there were 1,212,426 households in the Cleveland CSA Region, according to Minnesota IMPLAN Group (2008) files.

Table 2-6
Phase I PHEV Regional Economic Impacts, Cases I through V, LDV Fleet (\$2006)

Case	Impact	Scenario A		Scenario B	
		Output (\$M/yr)	Employment	Output (\$M/yr)	Employment
Case I 2006 Prices	Decrease Petroleum	-\$874.2	-5,038.3	-\$874.2	-5,038.3
	Decrease Refining	-\$433.3	-227.8	n/a	n/a
	Increase Electricity	\$460.5	2,165.7	\$460.5	2,165.7
	Increase HH Income	\$1,226.4	9,120.3	\$1,226.4	9,120.3
	Total	\$379.5	6,019.9	\$812.7	6,247.7
Case II 2008 Prices	Decrease Petroleum	-\$874.2	-5,038.3	-\$874.2	-5,038.3
	Decrease Refining	-\$433.3	-227.8	n/a	n/a
	Increase Electricity	\$460.5	2,165.7	\$460.5	2,165.7
	Increase HH Income	\$1,796.8	13,361.7	\$1,796.8	13,361.7
	Total	\$949.8	10,261.3	\$1,383.1	10,489.1
Case III 2030 Low Prices	Decrease Petroleum	-\$874.2	-5,038.3	-\$874.2	-5,038.3
	Decrease Refining	-\$433.3	-227.8	n/a	n/a
	Increase Electricity	\$460.5	2,165.7	\$460.5	2,165.7
	Increase HH Income	\$750.9	5,584.0	\$750.9	5,584.0
	Total	-\$96.1	2,483.5	\$337.2	2,711.3
Case IV 2030 High Prices	Decrease Petroleum	-\$874.2	-5,038.3	-\$874.2	-5,038.3
	Decrease Refining	-\$433.3	-227.8	n/a	n/a
	Increase Electricity	\$460.5	2,165.7	\$460.5	2,165.7
	Increase HH Income	\$1,790.8	13,317.4	\$1,790.8	13,317.4
	Total	\$943.8	10,216.9	\$1,377.1	10,444.7
Case V 2030 Very High Electricity	Decrease Petroleum	-\$874.2	-5,038.3	-\$874.2	-5,038.3
	Decrease Refining	-\$433.3	-227.8	n/a	n/a
	Increase Electricity	\$460.5	2,165.7	\$460.5	2,165.7
	Increase HH Income	\$1,340.5	9,968.8	\$1,340.5	9,968.8
	Total	\$333.4	6,868.3	\$926.8	7,096.2

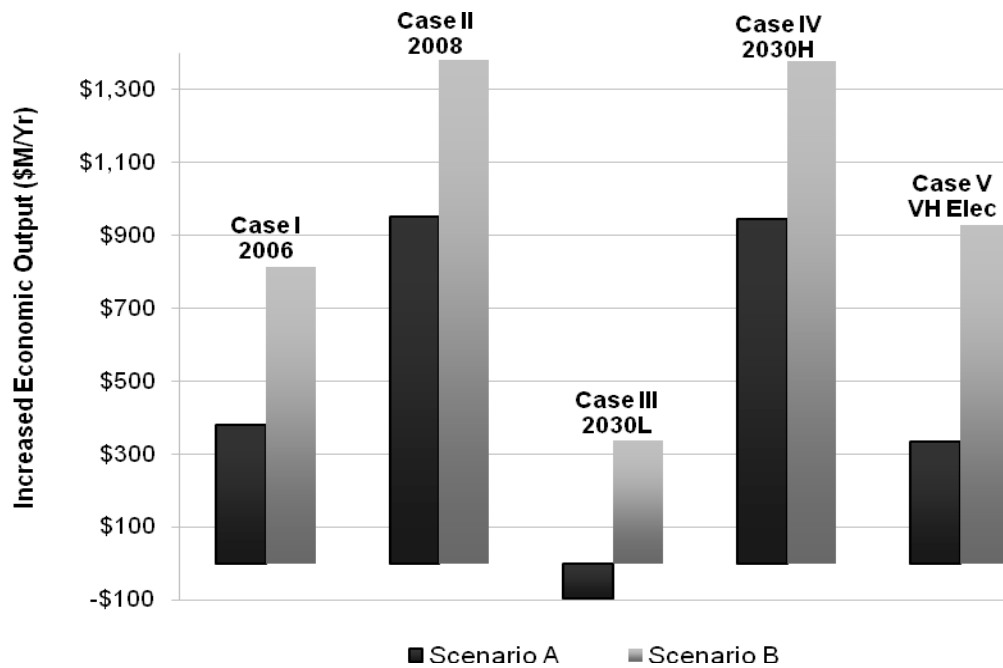


Figure 2-5
Phase I PHEV Total Economic Output Impacts, LDV Fleet

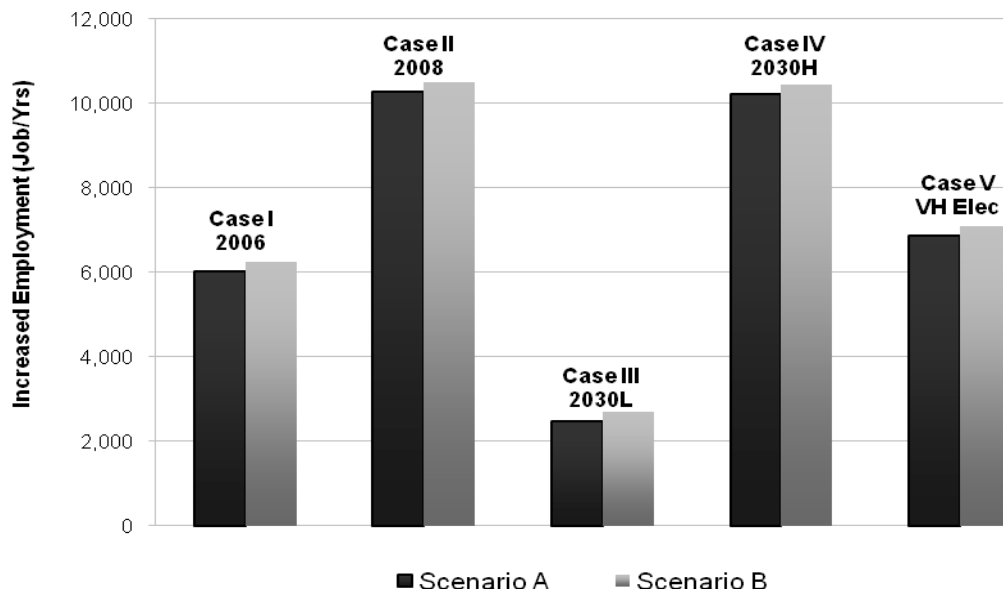


Figure 2-6
Phase I PHEV Total Employment Impacts, LDV Fleet

Regional Industry-Specific Impacts

The analysis indicates potential for significant economy-wide output and employment benefits of PHEV-related fuel switching in the GCA. Clearly, certain sectors of the economy will see greater relative increases in employment and output in response to fuel switching. Of particular interest in a region such as Cleveland (with a deteriorating-to-stagnant manufacturing/industry base) are potential positive impacts estimated for industry—non-government, non-retail—sectors in the economy. Table 2-8 and Table 2-9 present, for Case I and Case III, estimated economic impacts of LDV fuel displacement for the top ten industry sectors in the region.

Given Case I Scenario A assumptions, the Power Generation and Supply sector is estimated to see the most substantial positive impacts of PHEV-related fuel switching, with an output increase of 181 \$M/yr and increased employment of 353.6 jobs/yr.¹¹ Table 2-7 shows that the impacted sectors in the Cleveland region are diverse, as increases in economic activity are primarily a function of increased household income and expenditures. For instance, telecommunications and pharmaceutical manufacturing will see significant increases in both output and employment as households spend more of their disposable income in these areas. Telecommunications is expected to increase output by 12.1 \$M/yr, and employment in the sector is expected to increase by 35.6 jobs/yr, while pharmaceutical and medicine manufacturing will see estimated an increase in output of 10.6 \$M/yr, with employment increasing by 12.7 jobs/yr. Given Case I Scenario B assumptions, the top ten sectors for output and employment impacts are similar, though slightly greater increases in output and jobs are anticipated.

Note that as hundreds of sectors are included in the analysis, meaningful discussion of sector-specific output and employment impacts is impractical, and likely to be redundant in many respects. However, to illustrate the range and scale of impacts throughout the Cleveland economy, sector-specific employment and output impacts for Cases I and II, Scenarios A and B are available in Appendix E.

¹¹ As discussed in our concluding section, this calculation assumes that the relationship between employment and power generation remains constant and is based on the average employment/output ratios that currently exist. If the movement to PHEVs drives different approaches to power generation that veer from the average, the values reported here may change.

Table 2-7
Phase I PHEV Regional Economic Impacts, Cases I through V, HDV Fleet (\$2006)

Case	Impact	Scenario A		Scenario B	
		Output (\$M)	Employment	Output (\$M)	Employment
Case I 2006 Prices	Decrease Petroleum	-\$73.47	-423.43	-\$73.47	-423.43
	Decrease Refining	-\$36.42	-19.14	n/a	n/a
	Increase Electricity	\$39.68	186.63	\$39.68	186.63
	Increase HH Income	\$102.30	760.74	\$102.30	760.74
	Total	\$32.09	504.79	\$68.51	523.94
Case II 2008 Prices	Decrease Petroleum	-\$73.47	-423.43	-\$73.47	-423.43
	Decrease Refining	-\$36.42	-19.14	n/a	n/a
	Increase Electricity	\$39.68	186.63	\$39.68	186.63
	Increase HH Income	\$155.00	1,152.64	\$155.00	1,152.64
	Total	\$84.80	896.69	\$121.21	915.84
Case III 2030 Low Prices	Decrease Petroleum	-\$73.47	-423.43	-\$73.47	-423.43
	Decrease Refining	-\$36.42	-19.14	n/a	n/a
	Increase Electricity	\$39.68	186.63	\$39.68	186.63
	Increase HH Income	\$62.20	462.58	\$62.20	462.58
	Total	-\$8.00	206.63	\$28.42	225.78
Case IV 2030 High Prices	Decrease Petroleum	-\$73.47	-423.43	-\$73.47	-423.43
	Decrease Refining	-\$36.42	-19.14	n/a	n/a
	Increase Electricity	\$39.68	186.63	\$39.68	186.63
	Increase HH Income	\$149.65	1,112.89	\$149.65	1,112.89
	Total	\$79.45	856.94	\$115.86	876.09
Case V 2030 Very High Electricity	Decrease Petroleum	-\$73.47	-423.43	-\$73.47	-423.43
	Decrease Refining	-\$36.42	-19.14	n/a	n/a
	Increase Electricity	\$39.68	186.63	\$39.68	186.63
	Increase HH Income	\$110.88	824.54	\$110.88	824.54
	Total	\$40.67	568.60	\$77.09	587.74

Table 2-8

Case I PHEV LDV Fleet Scenario A Top Ten Impacted Industry Sectors*

Case/ Scenario	Output		Employment	
	Industry/Sector	Output (\$M) Employment	Industry/Sector	Jobs/yr
Case I Scenario A	Power generation and supply	\$ 181.0	Power generation and supply	353.6
	Telecommunications	\$ 12.1	Automotive repair and maintenance- except car wash	84.7
	Pharmaceutical and medicine manufacturing	\$ 10.6	Other maintenance and repair construction	39.2
	Oil and gas extraction	\$ 10.0	Telecommunications	35.6
	Automobile and light truck manufacturing	\$ 9.8	Architectural and engineering services	34.4
	Automotive repair and maintenance- except car wash	\$ 7.1	Oil and gas extraction	29.6
	Architectural and engineering services	\$ 4.0	Custom computer programming services	27.8
	Natural gas distribution	\$ 3.4	Other new construction	23.3
	Other maintenance and repair construction	\$ 2.6	Manufacturing and industrial buildings	14.6
	Maintenance and repair of nonresidential buildings	\$ 2.5	Pharmaceutical and medicine manufacturing	12.7
Case I Scenario B	Power generation and supply	\$ 181.4	Power generation and supply	354.4
	Oil and gas extraction	\$ 21.3	Automotive repair and maintenance- except car wash	86.2
	Telecommunications	\$ 12.4	Oil and gas extraction	62.8
	Pharmaceutical and medicine manufacturing	\$ 10.7	Other maintenance and repair construction	39.5
	Automobile and light truck manufacturing	\$ 10.0	Telecommunications	36.4
	Automotive repair and maintenance- except car wash	\$ 7.2	Other new construction	24.4
	Architectural and engineering services	\$ 4.6	Maintenance and repair of nonresidential buildings	21.4
	Petrochemical manufacturing	\$ 4.3	New residential additions and alterations- all	18.5
	Natural gas distribution	\$ 3.8	Bread and bakery product manufact	17.1
	Other maintenance and repair construction	\$ 2.7	Manufacturing and industrial buildings	15.3

*Results presented in \$2006.

Table 2-9
Case III LDV Fleet Scenario A Top Ten Impacted Industries

Case/ Scenario	Output		Employment	
	Industry/Sector	Output (\$M) Employment	Industry/Sector	Jobs/yr
Case III Scenario A	Power generation and supply	\$ 174.9	Power generation and supply	341.7
	Oil and gas extraction	\$ 7.9	New residential 1-unit structures- all	49.2
	Telecommunications	\$ 6.4	Automotive repair and maintenance- except car wash	48.7
	Pharmaceutical and medicine manufacturing	\$ 6.3	Commercial and institutional buildings	48.5
	Automobile and light truck manufacturing	\$ 5.9	Other maintenance and repair construction	34.7
	Automotive repair and maintenance- except car wash	\$ 4.1	Oil and gas extraction	23.3
	Other maintenance and repair construction	\$ 2.3	Telecommunications	18.7
	Architectural and engineering services	\$ 2.0	Architectural and engineering services	17.8
	New residential additions and alterations- all	\$ 2.0	New residential additions and alterations- all	10.9
	Natural gas distribution	\$ 1.9	Bread and bakery product manufact	10
Case III Scenario B	Power generation and supply	\$ 175.4	Power generation and supply	342.6
	Oil and gas extraction	\$ 19.2	Oil and gas extraction	56.5
	New residential 1-unit structures- all	\$ 8.0	New residential 1-unit structures- all	53.1
	Telecommunications	\$ 6.6	Commercial and institutional buildings	52.5
	Pharmaceutical and medicine manufacturing	\$ 6.4	Automotive repair and maintenance- except car wash	50.2
	Automobile and light truck manufacturing	\$ 6.1	Other maintenance and repair construction	35
	Commercial and institutional buildings	\$ 5.2	Architectural and engineering services	23.1
	Architectural and engineering services	\$ 2.7	Telecommunications	19.5
	Petrochemical manufacturing	\$ 2.5	Other new construction	14.5
	Other maintenance and repair construction	\$ 2.4	Bread and bakery product manufact	10.2

Conclusions

As mentioned above, the impact of petroleum displacement, electricity demand, and household income varies considerably by case. The results indicate that given prices at or above 2006 petroleum prices, economic impacts of PHEV-related fuel displacement would be positive, and considerable. Given very low petroleum prices, results indicate that economic impacts in the GCA could vary depending on Scenario: employment would increase invariably, but net economic output may decrease slightly if demand for petroleum refining in the region were to decrease.

Importantly, the employment and output associated with a dollar increase in household income is greater than that associated with a dollar of petroleum demand. Thus, we would expect that any increase in the price of petroleum fuels to result in more positive economic impacts of PHEV market penetration, as economic impacts of household spending would more than compensate for any losses in the petroleum sector. Likewise, reductions in petroleum prices would equate to less positive economic impacts in the region, though net impacts would not be negative unless gasoline prices fell well below \$2.00/gallon.

We recognize certain limitations to our Phase I findings. The I-O method inherently assumes static production functions, constant commodity prices, unconstrained labor markets, and production costs that are linear functions of production output (Lenzen and Dey 2002). The static nature of I-O analysis implies that future changes in the structure of the economy—such as the introduction of new industries—are not explicitly modeled. Thus, our results are applicable to a present day economic structure, despite the fact that we model hypothetical PHEV market penetration that might occur decades in the future. However, even with these limitations, we believe our results provide useful insights into the macroeconomic impacts that fuel switching could have in a regional economy. One interpretation of our results under these limitations is that we show what today's macroeconomic impacts would be if a larger portion of our current vehicle fleet were made up of PHEVs.

3

PHASE II: IMPACTS FROM NON-PHEV ELECTRIC TRANSPORTATION TECHNOLOGIES

Overview of Phase II

The Phase II portion of the GCA EDV economic valuation project involves two separate components: a) the estimation of petroleum displacement and increased electricity demand by non-PHEV electric drive technologies (EDT) in the GCA, and b) quantification of regional economic impacts due to estimated petroleum displacement. The methodological approach used in Phase II to quantify regional economic impacts of petroleum displacement is virtually identical to that applied in Phase I; therefore the reader is directed to Section 2 for details of the step-by-step approach. Where the Phase II methodological approach differs from Phase I, details are provided in this section.

Other Electric Drive Technology Scenarios and Data

Scenario Overview

Similar to Phase I, the level of regional economic impacts due to EDT use depends on three items: (1) the market penetration (number and usage of EDTs) in the region, (2) the amount and value of petroleum displaced with electricity according to EDT usage, and (3) the relationships between changes in fuel demand and the regional economy.

We use EDT penetration scenarios which were developed in a companion report prepared by the University of Toledo in which a detailed discussion of the scenario development methodology and study assumptions can be found. In the Toledo study, two potential EDT scenarios for the year 2020 were developed. The first was an *Expected Scenario* where baseline/low levels of EDT market penetration in the year 2020 were assumed; the second was an *Achievable Scenario* where high market penetration of EDTs was assumed. EDT technologies examined in the Toledo study and analyzed here include: truck stop electrification, off-road industrial vehicles, alternative marine power, electric transport refrigeration units, on-road battery electric vehicles, and lawn & garden equipment. We use petroleum displacement and increased electricity demand calculations provided to us for each of these scenarios to estimate changes in fuel expenditures in the GCA.

Estimates of gasoline and diesel displacement and increased electricity demand for the *Expected Scenario* and *Achievable Scenario* are shown in Table 3-1.

Table 3-1
Non-PHEV EDT Petroleum Displacement and Electricity Demand

Electric Drive Technology or Application	Expected Scenario EDT Fuel Displacement			Achievable Scenario EDT Fuel Displacement		
	GHG Reductions (Million Tons per year)	Gasoline/ Diesel Replacement (gallons per year)	Increase in Electricity Consumption (KWh per year)	GHG Reductions (Million Tons per year)	Gasoline/ Diesel Replacement (gallons per year)	Increase in Electricity Consumption (KWh per year)
Diesel Replacement Technologies						
Truck Stop Electrification	0.015	1,445,661	18,070,761	0.030	3,011,794	37,647,419
Off-Road Industrial Vehicles	0.019	1,867,312	23,341,400	0.176	17,468,403	218,355,033
Alternative Marine Power	0.010	963,774	12,047,174	0.052	5,120,049	64,000,613
Electric Transport Refrigeration Units	0.002	240,943	3,011,794	0.008	783,066	9,788,329
Other	0.001	60,236	752,948	0.014	1,385,425	17,317,813
Total Diesel Replacement	<i>0.046</i>	<i>4,577,926</i>	<i>57,224,078</i>	<i>0.280</i>	<i>27,768,737</i>	<i>347,109,207</i>
Gasoline Replacement Technologies						
On-Road Battery Electric Vehicles	0.002	276,537	3,456,718	0.075	8,572,660	107,158,246
Lawn & Garden Equipment	0.000	-	-	0.024	2,696,240	33,702,997
Total Gasoline Replacement	<i>0</i>	<i>276,537</i>	<i>3,456,718</i>	<i>0.099</i>	<i>11,268,899</i>	<i>140,861,242</i>
Total Increase in Electricity Demand			<i>60,680,795</i>			<i>487,970,449</i>

Valuation of Petroleum and Electricity Expenditures

We use the identical approach as that used in Phase I to value changes in demand for transportation fuels and determine the annual savings attributable to EDT use. We use GCA-specific annual average retail price data from the U.S. Bureau of Labor Statistics (BLS) to value changes in demand for electricity and gasoline (U.S. Bureau of Labor Statistics 2008), and region-specific U.S. DOE Energy Information Administration (EIA) average retail price data for diesel (U.S. DOE 2008b). We also employ DOE Annual Energy Outlook projections for 2030 energy prices (U.S. Department of Energy 2008). Finally, we develop an alternative price case where electricity prices are considerably higher than current or forecasted prices—double the current price in real terms.

In the Phase II analysis we employ identical energy prices as those used in Phase I. Though many of the EDT technologies examined in Phase II will be employed by commercial and industrial customers who pay lower electricity rates on average, we use residential electricity rates as a conservative estimate of fuel expenditure savings. Petroleum and electricity prices employed in the analysis are shown in Section 2, Table 2-4 and Figure 2-2.

As in Phase I, we conduct five energy price cases—2006, 2008, low and high 2030 prices, and very high electricity prices—to explore a range of potential local economic impacts due to EDT use (see Section 2 for details).

The changes in total energy expenditures give us the annual net savings in fuel expenditures; case-specific changes in annual fuel expenditures are shown in Table 3-2. Together these changes in fuel demand and fuel cost savings are employed in our regional input-output model to determine the overall impact on the regional economy.

Phase II Regional Input-Output Analysis

We apply a regional input output (RIO) analysis to determine the regional economic impact of EDT-related fuel shifts in the Cleveland area. Section 2 (Phase I) of this report provides a detailed description of the approach. This section provides a brief overview of the approach used in Phase II, in particular where the method differs from that employed in Phase I.

Decrease in Petroleum Demand

We model each case under two scenarios. The first scenario (Scenario A) assumes that the regional gasoline displacement due to EDT use affects demand in all industries that support a region's gasoline markets (including gasoline stations, transportation of fuel, wholesale trade, and petroleum refineries). In modeling Scenario A, we reduce demand for gasoline and diesel and all supporting input industries. Case-specific decreases in petroleum consumption are shown in Table 3-2.

Increase in Electricity Demand

To model impacts of electricity demanded in the GCA region, we calculate the value of increased electricity purchases by households due to PHEV use, and increase the corresponding demand for the power generation sector. Case-specific increases in electricity consumption are shown in Table 3-2.

Increase in Income

Fuel cost savings are calculated by subtracting increased electricity costs from petroleum savings. As in Phase I, to model economic impacts of fuel savings we allocate savings as increases in household income in the region. Many EDT technologies will be used by commercial and industry interests. As the extent of use of each EDT technology by industrial sector is unknown, we cannot estimate economic impacts of fuel savings to specific commercial or industrial interests—nor can we estimate the extent of savings to households in the region versus industry.

There are a number of ways in which commercial and industry interests could allocate fuel expenditure savings—the savings could be used to increase employment, increase employee wages, to reduce prices, to increase capital investment, or could be retained as profit. For the purposes of this study, we assume that fuel savings by businesses are passed onto the consumer—or households—in the form of increased wages. We allocate fuel savings to households using the same approach used in Phase I: we assign fuel costs savings to households using an income-weighted approach that allocates savings across nine household income brackets according to each bracket’s respective portion of petroleum consumption; we then allocate income according to the bracket-specific consumption functions of goods and services for the region. Case-specific increases in household income are shown in Table 3-2.

Results

Direct Impacts

This section presents the results of Phase II of our analysis. Table 3-2 shows the direct regional changes in EDT-related fuel expenditures for each case. As shown in Table 3-2, market penetration of EDTs implies a potentially significant shift of fuel spending patterns for the Cleveland region, depending on the level of use. Commercial, industrial and household consumers will spend less on petroleum fuel, will spend more on electricity, and will realize considerable annual fuel expenditure savings, or “increased income”.

Table 3-2
Direct Changes in EDT Fuel Expenditures

Impact	Direct Impact Case I 2006 (\$M/yr)	Direct Impact Case II 2008 (\$M/yr)	Direct Impact Case III 2030 Low (\$M/yr)	Direct Impact Case IV 2030 High (\$M/yr)	Direct Impact Case V VH Electricity (\$M/yr)
Expected Scenario					
Total Reduced Petroleum Demand	-12.9	-19.5	-9.1	-17.4	-17.4
• Reduced Gasoline Demand	-0.69	-0.97	-0.49	-0.93	-0.93
• Reduced Diesel Demand	-12.2	-18.6	-8.6	-16.4	-16.4
Increased Electricity Demand	5.5	5.6	5.2	5.6	11.2
Fuel Savings/Increased Income	7.5	13.9	3.9	11.8	6.2
Achievable Scenario					
Total Reduced Petroleum Demand	-102.4	-152.1	-72.0	-137.7	-137.7
• Reduced Gasoline Demand	-28.3	-39.6	-19.9	-38.0	-38.0
• Reduced Diesel Demand	-74.1	-112.6	52.1	-99.6	-99.6
Increased Electricity Demand	43.9	45.4	41.9	44.9	89.8
Fuel Savings/Increased Income	58.5	106.8	30.0	92.8	47.9

Regional Input-Output Analysis Results

Net Regional Impacts

Table 3-3 and Table 3-4 show economic output results for *Expected Scenario* and *Achievable Scenario*, Cases I through V. Figure 3-1 and Figure 3-2 show *Achievable Scenario* economic output results. As shown in the tables and figures, the impacts of shifts in transportation fuel expenditures vary considerably depending on scenario and case, though impacts are positive almost without exception. In the *Expected Scenario*, impacts are generally positive, though modest (impacts are roughly 1-2% Phase I impacts). In the *Achievable Scenario*, impacts are more substantial, approximately eight times the change in output and employment estimated in the *Expected Scenario*.

Table 3-3
Phase II Expected Scenario EDT (Non-PHEV) Regional Economic Impacts

Case	Impact	Scenario A		Scenario B	
		Output (\$M/yr)	Employment (Jobs/yr)	Output (\$M/yr)	Employment (Jobs/yr)
Case I 2006 Prices	Decrease Petroleum	-\$11.16	-64.34	-\$11.16	-64.34
	Decrease Refining	-\$5.53	-2.91	n/a	n/a
	Increase Electricity	\$9.49	44.63	\$9.49	44.63
	Increase HH Income	\$12.29	91.41	\$12.29	91.41
	Total	\$5.09	68.79	\$10.62	71.70
Case II 2008 Prices	Decrease Petroleum	-\$11.16	-64.34	-\$11.16	-64.34
	Decrease Refining	-\$5.53	-2.91	n/a	n/a
	Increase Electricity	\$9.49	44.63	\$9.49	44.63
	Increase HH Income	\$21.95	163.20	\$21.95	163.20
	Total	\$14.74	140.58	\$20.27	143.49
Case III 2030 Low Prices	Decrease Petroleum	-\$11.16	-64.34	-\$11.16	-64.34
	Decrease Refining	-\$5.53	-2.91	n/a	n/a
	Increase Electricity	\$9.49	44.63	\$9.49	44.63
	Increase HH Income	\$6.37	47.34	\$6.37	47.34
	Total	-\$0.84	24.72	\$4.69	27.63
Case IV 2030 High Prices	Decrease Petroleum	-\$11.16	-64.34	-\$11.16	-64.34
	Decrease Refining	-\$5.53	-2.91	n/a	n/a
	Increase Electricity	\$9.49	44.63	\$9.49	44.63
	Increase HH Income	\$19.42	144.42	\$19.42	144.42
	Total	\$12.21	121.80	\$17.75	124.71
Case V 2030 Very High Electricity	Decrease Petroleum	-\$11.16	-64.34	-\$11.16	-64.34
	Decrease Refining	-\$5.53	-2.91	n/a	n/a
	Increase Electricity	\$9.49	44.63	\$9.49	44.63
	Increase HH Income	\$10.21	75.95	\$10.21	75.95
	Total	\$3.01	53.33	\$8.54	56.24

Table 3-4
Phase II Achievable Scenario EDT (Non-PHEV) Regional Economic Impacts

Case	Impact	Scenario A		Scenario B	
		Output (\$M/yr)	Employment (Jobs/yr)	Output (\$M/yr)	Employment (Jobs/yr)
Case I 2006 Prices	Decrease Petroleum	-\$88.60	-510.65	-\$88.60	-510.65
	Decrease Refining	-\$43.92	-23.09	n/a	n/a
	Increase Electricity	\$75.74	356.22	\$75.74	356.22
	Increase HH Income	\$96.47	717.43	\$96.47	717.43
	Total	\$39.70	539.91	\$83.61	563.00
Case II 2008 Prices	Decrease Petroleum	-\$88.60	-510.65	-\$88.60	-510.65
	Decrease Refining	-\$43.92	-23.09	n/a	n/a
	Increase Electricity	\$75.74	356.22	\$75.74	356.22
	Increase HH Income	\$168.68	1,254.40	\$168.68	1,254.40
	Total	\$111.91	1,076.88	\$155.83	1,099.97
Case III 2030 Low Prices	Decrease Petroleum	-\$88.60	-510.65	-\$88.60	-510.65
	Decrease Refining	-\$43.92	-23.09	n/a	n/a
	Increase Electricity	\$75.74	356.22	\$75.74	356.22
	Increase HH Income	\$49.53	368.31	\$49.53	368.31
	Total	-\$7.25	190.79	\$36.67	213.88
Case IV 2030 High Prices	Decrease Petroleum	-\$88.60	-510.65	-\$88.60	-510.65
	Decrease Refining	-\$43.92	-23.09	n/a	n/a
	Increase Electricity	\$75.74	356.22	\$75.74	356.22
	Increase HH Income	\$153.05	1,138.17	\$153.05	1,138.17
	Total	\$96.27	960.65	\$140.19	983.74
Case V 2030 Very High Electricity	Decrease Petroleum	-\$88.60	-510.65	-\$88.60	-510.65
	Decrease Refining	-\$43.92	-23.09	n/a	n/a
	Increase Electricity	\$75.74	356.22	\$75.74	356.22
	Increase HH Income	\$78.96	587.19	\$78.96	587.19
	Total	\$22.18	409.67	\$66.10	432.76

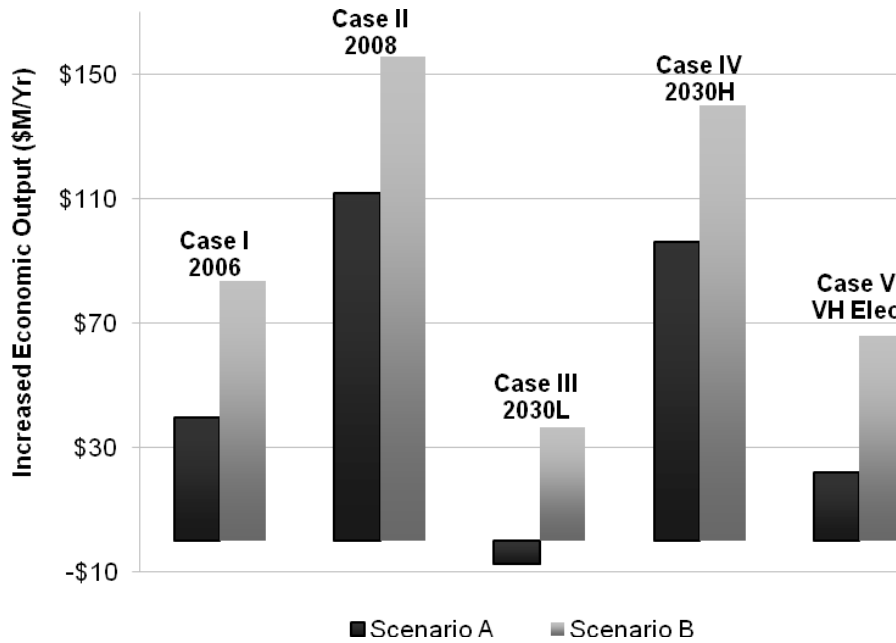


Figure 3-1
Phase II Achievable Scenario Economic Output Impacts

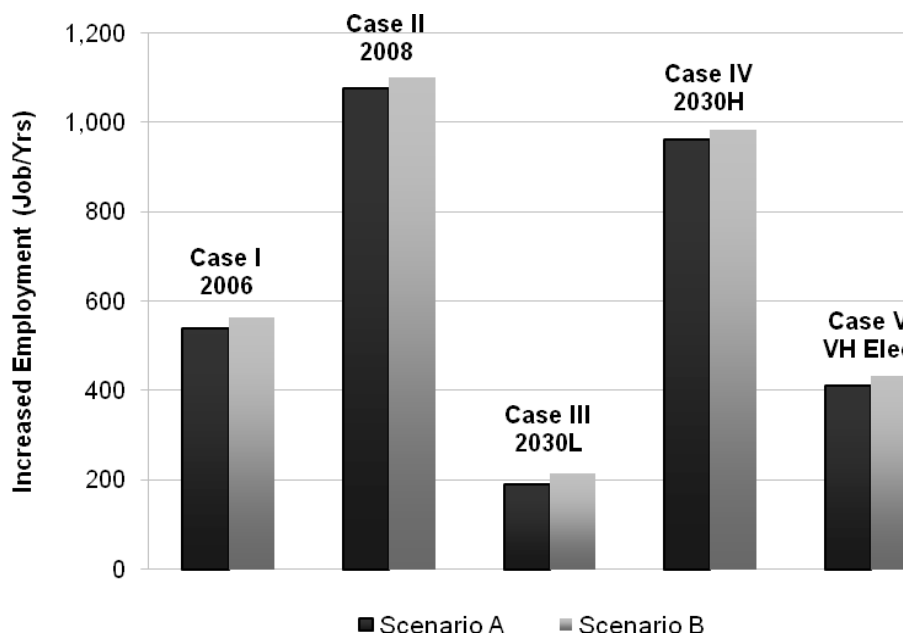


Figure 3-2
Phase II Achievable Scenario Employment Impacts

Phase II Conclusions

Given the results of our analysis, we conclude that given petroleum prices at or above 2006 levels, *positive regional economic impacts* will result in response to EDT market penetration and petroleum displacement in the GCA.

The relative differences in the *Expected Scenario* and *Achievable Scenario* results demonstrate that efforts and policies encouraging the use of EDTs can have regional economic payback, although not as significant as the expanded adoption of PHEVs as assessed in Phase I of the study. Though *Expected Scenario* impacts are generally positive, they are a fraction of those estimated for the *Achievable Scenario*. In the *Expected Scenario*, regional economic output is estimated to increase by millions of dollars, and regional employment is estimated to increase by dozens of jobs. However, in the *Achievable Scenario* regional economic output is estimated to increase by tens of millions *to over \$155 million*, and regional employment is estimated to increase by hundreds *to over 1,000 jobs*.

4

PHASE III: INDUSTRY GROWTH IMPACTS

Overview of Phase III

The Phase III portion of this research involves the estimation of regional economic impacts due to the local development of EDV-related businesses, technology and research. The local development of businesses and research supporting EDV production, service and infrastructure will equate to a number of direct impacts in the region, including the creation of construction and production jobs, an increase in economic output, and an increase in research and development activities. These direct impacts are associated with numerous indirect and induced impacts as well (discussed in more detail above). In this section of the report, we estimate the direct, indirect and induced impacts of industry development and research and development activities in the GCA Region.

Phase III of the GCA EDV economic valuation project involves two separate components: (a) estimation of local development of EDV-related industry and research, including construction of facilities, construction and production employment, and research and development activities; and, (b) quantification of regional economic impacts due to increased employment, research, and economic output, which is covered in this report.

The methodological approach used in Phase III is RIO, as in Phases I and II of this report. We note that the level of future development of EDV industries is less certain than the level of petroleum displacement from the use of EDVs. Therefore, in Phase III, we construct Regional Economic Impact Multipliers (REIMs) to estimate the potential economic impacts of each job created and each increase of economic output on the GCA economy.

Cleveland EDV Development Scenario

Scenario Overview

The level of regional economic impacts due to EDV industry development depends on two items: (1) the level of industry development, including the construction of facilities, level of production, number of jobs required, and expected research and development activities; (2) the relationships between construction, production, research activities, and increased employment in the regional economy.

We use an EDV business development scenario developed in a companion report, *Greater Cleveland Regional Plan of Action: Business Development Opportunities* (EDV Commercialization 2008), in which a more detailed discussion of the scenario development and

study assumptions can be found. The EDV Commercialization study developed a future scenario of large-scale EDV industry growth, estimating: jobs in EDV vehicle plant construction and production; increased employment by automobile industry suppliers; jobs in battery plant facility construction and production; jobs in recycling plant construction and production; jobs in infrastructure system supplier industries, and increases in research and development activities. Long-term production and research jobs were estimated for the years 2020 and 2030. The estimated increases in employment and economic activity are shown in Table 4-1 and Figure 4-1, and described briefly below.

Table 4-1
Direct Employment and Economic Impacts of EDV Industry Growth in GCA

Category	R&D Funding over 10 years	Facility Construction Job Potential	Production Job Potential by 2020	Production Job Potential by 2030
<i>New Vehicle Production Plant*</i>				
Plant 1 - 1M Sq Ft		1000	3000	4000
Plant 2 - 750K Sq Ft		750	2250	3000
Plant 3 - 500K Sq ft		500	1500	2000
Specialty Vehicle Plant Development**		600	2500	3000
<i>Battery Production and Recycling</i>				
Battery Plant		1200	500	600
Recycle Plant		600	1000	1200
<i>Auto Industry Suppliers (Parts)</i>			1138	2238
<i>Infrastructure System Supplier</i>			535	750
<i>Research and Development</i>	\$10M/yr		400	
*Modification to existing plant to support PHEV development;				
** Special Electric Vehicle - BEV auto - 600K SqFt;				
Research and Development *** 100M over 10 years				

Table adapted from *Greater Cleveland Regional Plan of Action: Business Development Opportunities* (EDV Commercialization 2008)

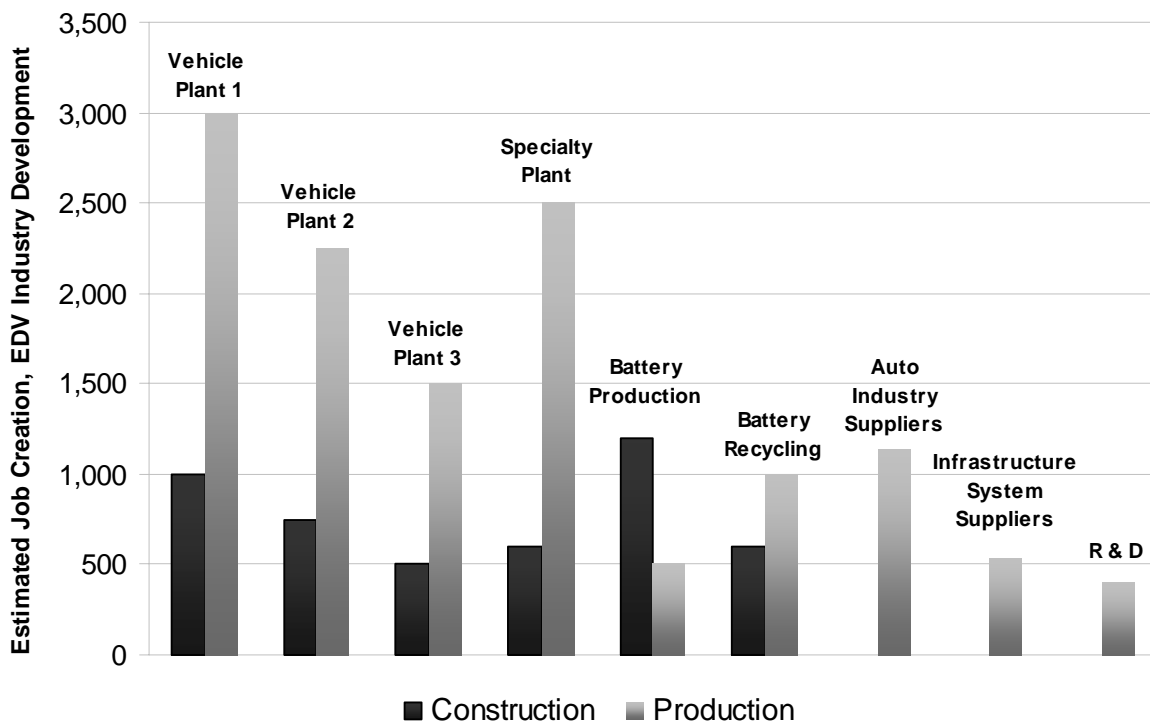


Figure 4-1
Estimated Job Creation, EDV Industry Development Scenario

New Vehicle Production Plant

If significant market penetration of PHEVs were to occur, production of PHEVs could increase substantially. The EDV Commercialization study estimated potential employment impacts if PHEV vehicle production were to take place in the GCA, estimating the job potential due to construction and modification of vehicle production plants, and the production job potential in the future. As shown in Table 4-1, the study estimates the employment impacts of modification or construction of four vehicle production plants, including construction jobs from modification of three existing plants to support PHEV development, jobs from construction of a specialty BEV plant, and estimated production jobs necessary in each plant in the future. As shown in the table, the EDV Commercialization study estimated the need for nearly 3,000 construction jobs to develop and modify vehicle plants, nearly 10,000 production jobs by 2020, and 12,000 production jobs by 2030.

Battery Production and Recycling

Large-scale market penetration of PHEVs and other EDTs would also require increased production of storage batteries and battery recycling facilities. The EDV Commercialization study estimated the potential employment impacts if battery manufacturing battery recycling industries were to develop in the GCA, estimating facility construction and permanent labor

requirements in the future. As shown in Table 4-1, the study estimated the employment impacts of construction of one battery production plant and one battery recycling plant in the region: 1,200 and 600 construction jobs, respectively. Future permanent production/labor requirements were also estimated: 500 production jobs in 2020 and 600 jobs on 2030 in battery production; and, 1,000 jobs in 2020 and 1,200 jobs in 2030 in battery recycling.

Auto Industry Suppliers

As noted in the EDV Commercialization study, the GCA has a history as an automobile component supplier and equipment manufacturer for automobiles and trucks; however, in the past several years, employment in the auto parts industry has decreased by nearly 13% in the Midwest. The EDV Commercialization study assumed that recent employment losses in the auto parts and supplier industries would be recouped over the next 10 years in response to increased production of PHEVs and BEVs. As shown in Table 4-1, the study estimates that auto part and supplier jobs will increase by 1,138 in 2020 and 2,238 in 2030.

Infrastructure System Suppliers

As discussed in more detail in the EDV Commercialization study, the large-scale market penetration of PHEVs and EDVs will require the development of supporting infrastructure, including energy storage, power generation, sensors, integrated communications, and power electronic controls. The EDV commercialization study predicts that infrastructure systems and components increase by 5% per year for the next 20 years based on the infrastructure modernization need and the commitment to infrastructure development by government and utilities. As shown in Table 4-1, the study estimates that infrastructure system supplier employment will increase by 535 jobs in 2020 and 750 jobs in 2030.

Research and Development

The path towards a future that is highly dependent on PHEVs and EDVs will require progress in vehicle and infrastructure development, and thus will require considerable research and development efforts in these areas. The EDV Commercialization study predicts that universities in the GCA region will attract a significant share of PHEV- and EDV-related funding— a minimum of \$10 million per year for 10 years, as shown in Table 4-1.

Conducting Regional Input-Output Analysis

As in Phases I and II of the EDV Valuation project, we apply regional input-output (RIO) analysis to determine the regional economic impact of PHEV and EDT-related business development and employment in the GCA. Table 4-1 identifies the shifts in economic activity examined in Phase III. In this Phase of the study, we develop REIMs for each shift in employment or economic activity, in addition to estimating the total impacts of each estimated shift.

For each economic impact presented in Table 4-1, there will be a series of direct, indirect and induced regional economic effects. These effects can be calculated in total; the effects may also be summarized through the construction of a *regional economic impact multiplier* (REIM), which is a convenient way to quantify the impacts associated with shifts of any magnitude in a regional economy.

The REIM not only captures the complex industrial interconnections in the regional economy, but also serves as a tool for quantifying total regional economic impacts of a shift of any scale. For instance, the *output* REIM has units of “million dollars output per job” (\$M/job). This REIM can be multiplied by the expected increase in employment in an industry (in jobs) to calculate the total regional impacts of increased employment in the region. Likewise, the REIM may be used to calculate the economic impacts associated with the change in one job in a given industry.

As noted earlier, employment changes in potentially-developing EDV industries in the GCA are less certain than the quantity of fuel displaced by a defined level of PHEV and EDV market penetration; therefore, we develop REIMs to allow quantification of impacts due to industry development of any scale in the GCA.

Although we calculate REIMs for all of the impacts listed in Table 4-1, we note that our confidence in some of the REIMs is lower than others. In particular, there is uncertainty surrounding the economic production functions associated with PHEV and EDT production, battery production and recycling. Data describing the production functions of future industries of PHEV, EDT and battery manufacturing are simply not available; here we use the existing production functions of the most representative industries (i.e. automobile manufacturing, auto parts manufacturing, storage battery manufacturing) to develop estimates of regional economic impacts.

To determine the total regional economic impacts of potential EDV industry development in the GCA, the individual REIMs discussed in the previous section are multiplied by the economic activity shifts shown in Table 4-1, as estimated in the EDV Commercialization study.

Results

Regional Economic Impact Multiplier (REIM) Results

This section presents the REIMs developed for the Phase III portion of the analysis. REIMs are provided for *Output* (dollars per job—\$/job), *Employment* (regional jobs per job—jobs/job), and *Labor Income* (dollars per job--\$/job). REIMs for Research and Development (R&D) are measured as *Output* (dollars per dollar increased demand--\$/dollar), *Employment* (jobs per million dollars increased demand—jobs/\$M), and *Labor Income* (dollars per dollar increased demand --\$/dollar). Table 4-2 and Figure 4-2 present total (sum of direct, indirect and induced) REIMs for EDV-related industry development employment in the GCA.

Table 4-2
EDV Industry Employment REIM, 2020 Impacts in \$2006

EDV Industry/Sector	Output (\$/Job)	Employment (Job-Yrs/Job)	Labor Income (\$/Job)
All Construction (Vehicle, Battery Plant, etc)			
Facility Construction Jobs	172,645	1.8	77,018
New Vehicle Production Plant			
Automobile & Truck Manufacturing Jobs	2,249,919	6.9	397,642
Auto Industry Suppliers (Parts)			
Motor Vehicle Parts Manufacturing Jobs	628,445	3.1	175,553
Battery Production Plant			
Storage Battery Production Jobs	529,471	3.0	163,811
Battery Recycling Plant			
Recycle Plant (Waste Remediation) Jobs	335,168	2.5	113,237
Infrastructure System Supplier			
Power Generation & Supply Jobs	1,008,027	5.6	284,328
Power and Specialty Transformer Manufacture Jobs	434,574	2.6	117,876
Broadcast and Wireless Communication Equip	873,901	3.7	159,164
Other Communications Equipment Manufacture	599,822	3.3	154,164
Electric Component Manufacture	355,689	2.2	95,947
Research and Development	(\$/\$)	(Jobs/\$M)	(\$/\$)
\$ 1M Research & Development Services	2.145	19.0	.801
\$1M Colleges, Universities and Jr Colleges	2.151	26.7	.983

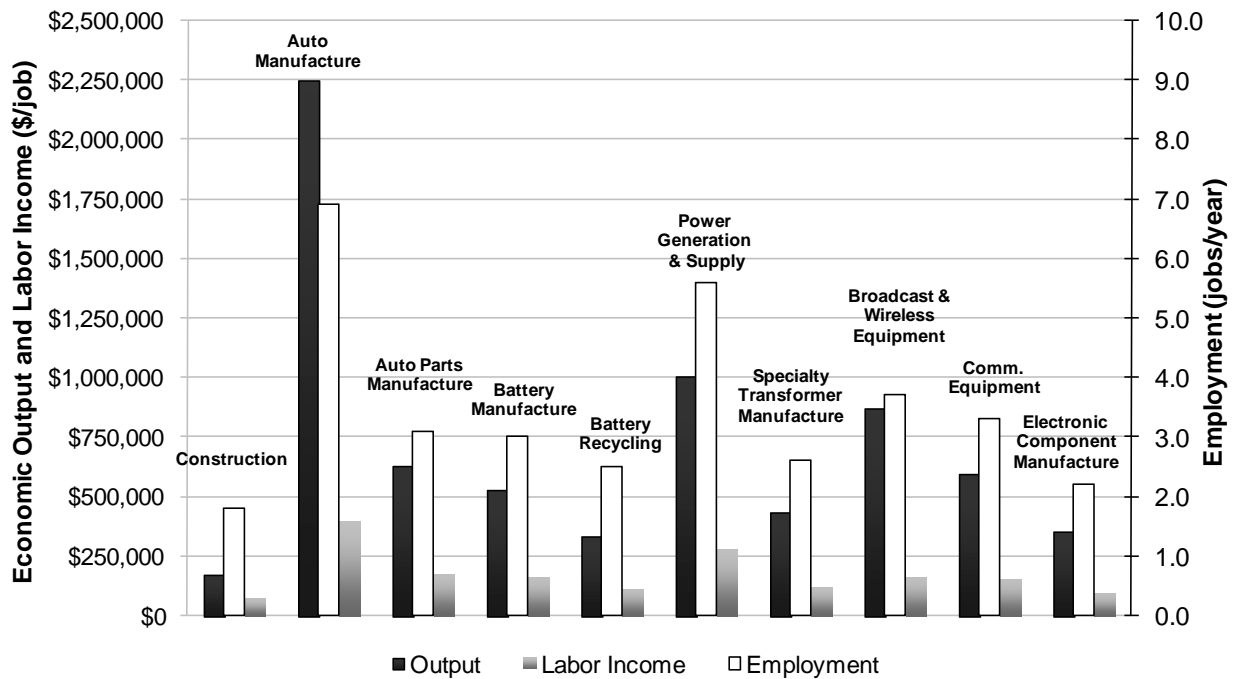


Figure 4-2
GCA EDV Industry Development Regional Economic Impact Multipliers

Potential impacts of development of EDV industries and related job creation are potentially significant, though they vary considerably across sectors, as shown in Table 4-2 and Figure 4-2.

Facility and Plant Construction Jobs REIMs

Facility and plant construction jobs include those involved in construction of new vehicle production plants, battery production plants, and battery recycling plants. The REIMs demonstrate that for every construction job created in the GCA economy, economic output will increase by over \$172,000 (due to direct, indirect, and induced effects discussed earlier), 1.8 jobs will be created economy-wide, and labor income will increase by over \$77,000 in the region. Though the potential impacts of increased construction are significant, we note that these jobs are temporary as are any related economic impacts.

Vehicle Production Jobs REIMs

As shown in Table 4-2, the potential economic impacts of automobile manufacturing jobs are considerable, as the creation of one job (in 2006) is associated with a 2.25 \$M increase in economic output, an economy-wide increase of 6.9 jobs, and an increase in labor income of nearly \$400,000.

Auto Industry Parts Suppliers REIMs

The potential impacts of recouping jobs in automobile parts manufacturing are also substantial: as shown in Table 4-2, the creation of one job (in 2006) is associated with a \$628,000 increase in economic output, an economy-wide increase of 3.1 jobs, and an increase in labor income of over \$175,500.

Battery Production Jobs REIMs

As shown in Table 4-2, the regional economic impacts associated with jobs in battery production are similar to those associated with automobile industry suppliers. The creation of one job (in 2006) is associated with nearly a \$529,000 increase in economic output, an economy-wide increase of 3.0 jobs, and an increase in labor income of over \$163,800.

Battery Recycling Jobs REIMs

The total regional economic impacts associated with jobs in the recycling sector are potentially significant, though the impacts per job are lower than those estimated in other sectors. The creation of one job (in 2006) is associated with a \$335,000 increase in economic output, an increase of 2.5 jobs total, and an increase in labor income of over \$113,000.

Infrastructure System Supplier REIMs

There are a number of industry sectors that could see potential growth given development of PHEV and EDV infrastructure. These include: power generation and supply, power and specialty transformer manufacture, broadcast and wireless communication equipment, other communications equipment manufacture, and electric component manufacture. As shown in Table 4-2, relative impacts of increased employment vary significantly by sector, with power generation and supply jobs associated with the greatest relative impacts and electric component manufacture jobs associated with the least. The creation of one job in power generation and supply is associated with increased economic output of over \$1M, an increase of 5.6 jobs economy-wide and an increase in labor income of over \$284,000. The creation of one job in electric component manufacture is associated with over \$355,000 increase in economic output, an increase of 2.2 jobs, and an increase in labor income of nearly \$96,000. Economic impacts of job creation in other infrastructure system supplier sectors fall between those estimated for power generation and electric component manufacture.

Research and Development REIMs

The influx of funding for EDV-related research could lead to significant economic impacts in the GCA. As shown in Table 4-2, for every million dollars increase¹² in demand for research and development services in 2006, regional economic output will increase by over 2.1\$M/yr,

¹² Note that impacts of in demand for research and development services are measured in \$/\$ and jobs/\$M

regional employment will increase by 19 jobs/yr and labor income will increase by over \$800,000. For every million dollars increase in demand for colleges, universities, and junior colleges in 2006, regional economic output will increase by 2.2 \$M/yr, employment will increase by nearly 27 jobs/yr and labor income will increase by \$712,000.

As the GCA EDV Industry REIMs demonstrate, there are potentially substantial economic impacts associated with development of, and increases of employment in, EDV-related industries in the Greater Cleveland region. The following section presents estimated total economic impacts of a future EDV industry development scenario where thousands construction, production, and manufacturing jobs are required in EDV-related industries.

Total Phase III Regional Economic Impact Results

This section presents the estimated total regional economic impacts of increased employment and EDV industry development in the GCA. Impacts are reported for *Output* (millions of dollars—\$M), *Employment* (job-years—jobs/yr), and *Labor Income* (\$M). Table 4-3 presents total (sum of direct, indirect and induced) impacts of the examined EDV industry development scenario in the GCA, assuming impacts taking place in 2006.

As shown in the table, the potential impacts of EDV-related industry development in Greater Cleveland region are considerable. Economic impacts of new vehicle plant construction—specifically the direct addition of 2,850 construction jobs—would amount to an increased economic output of over \$490 million, total employment increasing by 5,130 jobs/yr, and increased labor income of nearly \$220 million. The addition of four new vehicle production plants and 12,100 production jobs would equate to over \$21 billion in increased output, nearly 70,000 jobs/yr created and an increase in labor income of nearly \$3.9 billion. Construction and production in battery manufacturing and recycling could increase output by over \$910 million per year, increase regional employment by nearly 7,250 jobs per year, and increase labor income by \$334 million per year. Research and development activities could increase output by \$21.5 million per year, increase employment by nearly 230 jobs per year, and increase labor income by nearly \$9 million per year. Regional economic impacts of infrastructure system supplier industries range from \$190-\$539 million per year increased economic output, 1,177-2,996 jobs per year increase in employment, and \$51-\$152 million per year increased labor income.

Note that these results do not assess potential negative economic impacts in the region associated with a decline in the domestic auto industry corresponding to reduced production of conventional vehicles as the shift to EDVs occurs. However, it should further be noted that any such losses are likely to occur in the future if/when the shift to EDVs occurs, whereas much of the economic opportunities associated with local EDV production will only occur if the GCA mobilizes in a coordinated fashion to pursue them.

Table 4-3
Total RIO Impacts (2006\$)

	Number of Jobs	Output (\$M)	Employment (Jobs/yr)	Labor Income (\$M)
New Vehicle Production Plant Construction				
Plant 1 - 1M Sq Ft	1000	\$172.6	1,800.0	\$77.0
Plant 2 – 750k Sq Ft	750	\$129.5	1,350.0	\$57.8
Plant 3 - 500K Sq ft	500	\$86.3	900.0	\$38.5
Specialty Vehicle Plant Development**	600	\$103.5	1,080.0	\$46.2
New Vehicle Production Plant Construction Total	2850	\$491.9	5,130.0	\$219.50
New Vehicle Production Plant				
Plant 1 - 1M Sq Ft	3000	\$6,749.8	20,700.0	\$1,192.9
Plant 2 – 750k Sq Ft	2250	\$5,062.3	15,525.0	\$894.7
Plant 3 - 500K Sq ft	1500	\$3,374.9	10,350.0	\$596.5
Specialty Vehicle Plant Development**	2500	\$5,624.8	17,250.0	\$994.1
Total New Vehicle Production Jobs	12,100	\$21,303.7	68,955.0	\$3,897.7
Motor Vehicle Parts Manufacturing Jobs (2006)	1138	\$715.2	3,527.8	\$199.8
Battery Production and Recycling Plant				
Battery Production Plant Construction Jobs	1200	\$207.2	2,160.0	\$92.4
Storage Battery Production Jobs	500	\$264.7	1,507.4	\$81.9
Battery Recycle Plant Construction Jobs	600	\$103.6	1,080.0	\$46.2
Recycle Plant (Waste Remediation) Jobs	1000	\$335.2	2,500.0	\$113.2
Total Battery Production and Recycling Plant	3300	\$910.7	7,247.4	\$333.7
Research and Development	\$ R&D	(\$M)	(Jobs)	(\$M)
\$ 5M Research & Development Services (2006)	\$5M	\$10.7	95.0	\$4.0
\$5M Colleges, Universities and Jr Colleges (2006)	\$5M	\$10.8	133.5	\$4.9
Total Research & Development	\$10M	\$21.5	228.5	\$8.9
Infrastructure System Supplier (Total Jobs)	535			
Power Generation & Supply	535	\$539.3	2,996.0	\$152.1
Power and Specialty Transformer Manufacture	535	\$232.5	1,391.0	\$63.1
Broadcast and Wireless Communication Equip	535	\$467.5	1,979.5	\$85.2
Other Communications Equipment Manufacture	535	\$320.9	1,765.5	\$82.5
Electric Component Manufacture	535	\$190.3	1,177.0	\$51.3
Total Infrastructure System Supplier (Range)		\$190.3 to \$539.3	1,177.0 to 2,996.0	\$51.3 to \$152.1
Total Range		\$23,633 to 23,982	86,265.7 to 88,084.7	\$4,710.9 to \$4811.7

Phase III Conclusions

Given the results of our analysis, we conclude that large-scale development of EDV-supporting industries in the GCA has the potential to generate *considerable positive regional economic impacts*. The GCA, like many urban areas in the United States, has seen its manufacturing base (and related employment) erode significantly in recent years. The GCA in particular has seen employment in manufacturing decline since 2002, due to regional concentration of industrial activity in support of the domestic auto industry, which has faced severe challenges. The results of this study demonstrate that the targeted development of EDV-related industries (including new PHEV vehicle production) has the potential to recoup employment losses while having enormously positive economic impacts in the GCA. Thus, efforts and policies to incentivize development of EDV-related industries can result in potentially large economic benefits to the region.

5

REFERENCES

- Casler, S. and S. Wilbur (1984). Energy Input-Output Analysis. *Resources and Energy* **6**, 187-201.
- Chen, D., B. Fang, et al. (2002). Household-Provided Transportation: An Extension of the Transportation Satellite Accounts. *Journal of Transportation and Statistics* **Vol 5**(2/3), 5.
- EPRI (2001). *Comparing the Benefits and Impacts of Hybrid Electric Vehicle Options*, EPRI, Palo Alto, CA: 2001. 1000349.
- EPRI (2006). *Regional Economic Benefits from Electric Transportation: Case Study of the Cleveland, Ohio Metropolitan Statistical Area*. EPRI, Palo Alto, CA: 2006. 1012466.
- EPRI (2007). *Plug-in Hybrid Electric Vehicles and Petroleum Displacement: A Regional Economic Impact Assessment*. EPRI, Palo Alto, CA: 2007. 1013781.
- EPRI and NRDC (2007). *Environmental Assessment of Plug-In Hybrid Electric Vehicles, Volume 1: Nationwide Greenhouse Gas Emissions*. EPRI, Palo Alto, CA: 2007. 1015325.
- Fang, J. M. (1998). Multipliers for Assessing the Economic Impacts of Investment in Advanced Vehicle Transportation Technologies Based on 1992 Industry Structure and 1995 Regional Data: An Update. Washington, DC, National Renewable Energy Lab.
- Hackney, J. and R. de Neufville (2001). Life cycle model of alternative fuel vehicles: emissions, energy, and cost trade-offs. *Transportation Research Part A* **35**, 243-266.
- Hawdon, D. and P. Pearson (1995). Input-output simulations of energy, environment, economy interactions in the UK. *Energy Economics* **17**(1), 73-86.
- Kempton, W. and S. E. Letendre (1997). Electric vehicles as a new power source for electric utilities. *Transportation Research Part D - Transport and Environment* **2**(3), 157-175.
- Kempton, W. and J. Tomic (2001). Vehicle-to-grid power: Battery, Hybrid and Fuel Cell Vehicles as Resources for Distributed Electric Power in California, California Air Resources Board.
- Kempton, W. and J. Tomic (2005). Vehicle-to-grid power implementation: from stabilizing the grid to supporting large-scale renewable energy. *Journal of Power Resources* **144**, 280-294.

References

- Klein, L. R., V. G. Duggal, et al. (2005). The sensitivity of the general price level to changes in the price of crude oil. *Business Economics* **40**(4), 74-77.
- Lenzen, M. and C. Dey (2002). Economic, energy and greenhouse emissions impacts of some consumer choice, technology and government outlay options. *Energy Economics* **24**, 377-403.
- Letendre, S. and W. Kempton (2002). The V2G [Vehicle to Grid] concept: a new model for power? *Public Utilities Fortnightly*, 16-26.
- Lindly, J. K. and T. A. Haskew (2002). Impact of electric vehicles on electric power generation and global environmental change. *Advances in Environmental Research* **6**, 291-302.
- Mierlo, J. V., G. Maggetto, et al. (2006). Which energy source for road transport in the future? A comparison of battery, hybrid, and fuel cell vehicles. *Energy Conversion and Management* **47**, 2748-2760.
- Miller, R. E. and P. D. Blair (1985). Input-Output Analysis: Foundations and Extensions. Englewood Cliffs, NJ, Prentice-Hall, Inc.
- Minnesota IMPLAN Group Inc. (2004). Implan Professional User Guide. Stillwater, Minnesota.
- Ohio Department of Public Safety Information Technology Office (2006). Cleveland Vehicle Population.
- Park, S.-H. (1982). An input-output framework for analysing energy consumption. *Energy Economics* **April**, 105-110.
- Romm, J. (2006). The car and fuel of the future. . *Energy Policy* **34**, 2609-2614.
- U.S. Bureau of Labor Statistics. (2008). "Databases, Tables, and Calculators by Subject: Inflation & Prices." Retrieved 9/8/2008, from <http://www.bls.gov/data/#prices>.
- U.S. Department of Energy (2001). Quality Metrics -- Final Report. Washington, DC, Office of Transportation Technologies.
- U.S. Department of Energy (2002). National Hydrogen Energy Roadmap. Washington, DC, U.S. Department of Energy.
- U.S. Department of Energy (2002a). Quality Metrics -- Final Report. Washington, DC, Office of Transportation Technologies.
- U.S. Department of Energy, E. I. A. (2007). Annual Energy Outlook 2007 with Projections to 2030.
- U.S. Department of Energy, E. I. A. (2008). Annual Energy Outlook 2008 with Projections to 2030.

- U.S. Department of Transportation, F. H. A. (2006). "Licensed Drivers, Vehicle Registrations and Resident Population." Retrieved 8/10/2006, from <http://fhwa.dot.gov/policy/ohim/hs04/htm/dlchrt.htm>
- U.S. DOE, E. I. A. (2008b, 8/25/2008). "Retail Prices for Diesel (On-Highway)-- All Types." Retrieved 8/26/2008, from http://tonto.eia.doe.gov/dnav/pet/pet_pri_gnd_a_epd2d_pte_cpgal_w.htm.
- U.S. DOE EIA (2008). Annual Energy Outlook 2008 with Projections to 2030.
- U.S. Environmental Protection Agency. (2006e). "Six Common Air Pollutants." Retrieved 8/10/2006, from <http://www.epa.gov/air/urbanair/>.
- U.S. Environmental Protection Agency. (2006j, December 5th). "County Emission Summary by Source Category (EI T-3 NET96): Cuyahoga Co, OH " Retrieved 12/05/2006, from <http://www.epa.gov/ttn/naaqs/ozone/areas/state/tier3/s39035t3.htm>.
- U.S. Environmental Protection Agency. (2007f). "Clean Interstate Rule - Ohio." Retrieved 9/8/2008, from <http://www.epa.gov/CAIR/oh.html>.
- U.S. Environmental Protection Agency. (2008a, 8/15/2008). "Green Book: 8-Hour Ozone Nonattainment Area State Map - Ohio." Retrieved 9/8/2008, from <http://www.epa.gov/air/oaqps/greenbk/oh8.html>.
- U.S. Environmental Protection Agency. (2008c, 8/15/2008). "Green Book: Ohio PM-2.5 Nonattainment Areas." Retrieved 9/8/2008, from <http://www.epa.gov/air/oaqps/greenbk/oh25.html>.
- U.S. EPA. (2008b, 8/15/2008). "Counties designated as Nonattainment for PM-2.5 and/or 8-hour Ozone Standard." Retrieved 9/8/2008, from <http://www.epa.gov/air/oaqps/greenbk/mappm25o3.html>
- U.S. EPA. (2008b, 8/15/2008). "Nonattainment and Maintenance Areas in the U.S. 8-hour Ozone Standard." Retrieved 9/8/2008, from <http://www.epa.gov/air/oaqps/greenbk/map8hrnm.html>.
- Winebrake, J. J. (2003). The Future Impacts of Electric Drive Vehicles: A Case of Normative Scenario Modeling. *Futures Research Quarterly* **19**(1).
- Wu, R.-H. and C.-Y. Chen (1990). On the application of input-output analysis to energy issues. *Energy Economics* **January**, 71-76.

A

APPENDIX A: VEHICLE-CLASS AND COUNTY DATA

Table A-1
PHEV Scenario VMT and eVMT by County and Vehicle Class

MSA/County	Vehicle Type	Total VMT (million/year)	eVMT fraction	eVMT (millions)
Ashtabula	LDDT	3.62	17.7%	0.64
Ashtabula	LDDV	0.54	17.7%	0.10
Ashtabula	LDGT12	721.90	19.2%	138.41
Ashtabula	LDGT34	246.12	17.9%	43.99
Ashtabula	LDGV	602.86	21.8%	131.12
Ashtabula	HDDDB	7.56	0.0%	0
Ashtabula	HDDV2B	14.09	17.7%	2.50
Ashtabula	HDDV345	16.37	16.4%	2.68
Ashtabula	HDDV67	36.76	0.0%	0
Ashtabula	HDDV8	135.68	0.0%	0
Ashtabula	HDGV	60.72	16.2%	9.87
Cuyahoga	LDDT	40.21	17.7%	7.12
Cuyahoga	LDDV	6.35	17.7%	1.13
Cuyahoga	LDGT12	8016.71	19.2%	1,537.11
Cuyahoga	LDGT34	2733.13	17.9%	488.52
Cuyahoga	LDGV	7072.35	21.8%	1,538.24
Cuyahoga	HDDDB	41.03	0%	0
Cuyahoga	HDDV2B	157.67	17.8%	27.93
Cuyahoga	HDDV345	124.26	16.4%	20.38
Cuyahoga	HDDV67	279.04	0%	0
Cuyahoga	HDDV8	710.69	0%	0
Cuyahoga	HDGV	632.58	16.9%	106.73
Geauga	LDDT	2.96	17.7%	0.52
Geauga	LDDV	0.44	17.7%	0.08
Geauga	LDGT12	590.67	19.2%	113.25
Geauga	LDGT34	201.38	17.9%	35.99
Geauga	LDGV	486.34	21.8%	105.78

Table A-1 (continued)
PHEV Scenario VMT and eVMT by County and Vehicle Class

MSA/County	Vehicle Type	Total VMT (million/year)	eVMT fraction	eVMT (millions)
Geauga	HDDDB	6.97	0.0%	0
Geauga	HDDV2B	11.50	17.7%	2.04
Geauga	HDDV345	14.45	16.4%	2.37
Geauga	HDDV67	32.44	0.0%	0
Geauga	HDDV8	125.63	0.0%	0
Geauga	HDGV	50.45	16.1%	8.12
Lake	LDDT	6.35	17.7%	1.13
Lake	LDDV	0.99	17.7%	0.18
Lake	LDGT12	1266.20	19.2%	242.78
Lake	LDGT34	431.68	17.9%	77.16
Lake	LDGV	1105.44	21.8%	240.44
Lake	HDDDB	7.80	0.0%	0
Lake	HDDV2B	24.87	17.7%	4.41
Lake	HDDV345	21.39	16.4%	3.51
Lake	HDDV67	48.04	0.0%	0
Lake	HDDV8	136.70	0.0%	0
Lake	HDGV	101.19	16.7%	16.94
Lorain	LDDT	8.26	17.7%	1.46
Lorain	LDDV	1.29	17.7%	0.23
Lorain	LDGT12	1647.38	19.2%	315.86
Lorain	LDGT34	561.64	17.9%	100.39
Lorain	LDGV	1433.77	21.8%	311.85
Lorain	HDDDB	10.65	0.0%	0
Lorain	HDDV2B	32.34	17.7%	5.73
Lorain	HDDV345	28.51	16.4%	4.68
Lorain	HDDV67	64.03	0.0%	0
Lorain	HDDV8	187.26	0.0%	0
Lorain	HDGV	132.15	16.7%	22.08
Medina	LDDT	5.33	17.7%	0.94
Medina	LDDV	0.80	17.7%	0.14
Medina	LDGT12	1063.35	19.2%	203.88
Medina	LDGT34	362.53	17.9%	64.80
Medina	LDGV	891.98	21.8%	194.01

Table A-1 (continued)
PHEV Scenario VMT and eVMT by County and Vehicle Class

MSA/County	Vehicle Type	Total VMT (million/year)	eVMT fraction	eVMT (millions)
Medina	HDDDB	10.68	0.0%	0
Medina	HDDV2B	20.76	17.7%	3.68
Medina	HDDV345	23.51	16.4%	3.85
Medina	HDDV67	52.78	0.0%	0
Medina	HDDV8	191.49	0.0%	0
Medina	HDGV	89.00	16.3%	14.50
Portage	LDDT	5.85	17.7%	1.04
Portage	LDDV	0.88	17.7%	0.16
Portage	LDGT12	1166.58	19.2%	223.67
Portage	LDGT34	397.72	17.9%	71.09
Portage	LDGV	980.22	21.8%	213.20
Portage	HDDDB	11.53	0.0%	0
Portage	HDDV2B	22.79	17.7%	4.04
Portage	HDDV345	25.54	16.4%	4.19
Portage	HDDV67	57.34	0.0%	0
Portage	HDDV8	206.60	0.0%	0
Portage	HDGV	97.46	16.3%	15.90
Summit	LDDT	16.86	17.7%	2.99
Summit	LDDV	2.64	17.7%	0.47
Summit	LDGT12	3361.33	19.2%	644.49
Summit	LDGT34	1145.98	17.9%	204.83
Summit	LDGV	2940.76	21.8%	639.62
Summit	HDDDB	20.00	0.0%	0
Summit	HDDV2B	66.03	17.8%	11.70
Summit	HDDV345	55.85	16.4%	9.16
Summit	HDDV67	125.42	0.0%	0
Summit	HDDV8	349.89	0.0%	0
Summit	HDGV	267.95	16.8%	44.93

B

APPENDIX B: EXAMPLE OUTPUT IMPACT REPORT

IMPACT: Cleveland Case IV Approach A Net Impacts

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
1 Oilseed farming	1,793	-113	412	2,093
2 Grain farming	3,836	7,058	1,871	12,766
3 Vegetable and melon farming	44,527	9,590	8,994	63,112
4 Tree nut farming	18	1	3	23
5 Fruit farming	24,269	5,913	5,030	35,212
6 Greenhouse and nursery production	503,356	112,845	112,851	729,052
7 Tobacco farming	0	0	0	0
8 Cotton farming	0	0	0	0
9 Sugarcane and sugar beet farming	0	0	0	0
10 All other crop farming	3,807	22,214	4,461	30,482
11 Cattle ranching and farming	8,586	269,460	46,757	324,803
12 Poultry and egg production	9,706	5,076	2,468	17,249
13 Animal production- except cattle and	73,914	31,843	19,177	124,934
14 Logging	0	8,370	1,998	10,368
15 Forest nurseries- forest products- and	0	0	0	0
16 Fishing	0	0	0	0
17 Hunting and trapping	18,244	85	3,358	21,687
18 Agriculture and forestry support activi	10,692	9,173	3,598	23,463
19 Oil and gas extraction	-2,612,122	4,908,544	234,336	2,530,758
20 Coal mining	0	0	0	0
21 Iron ore mining	0	0	0	0
22 Copper- nickel- lead- and zinc mining	0	0	0	0
23 Gold- silver- and other metal ore mini	0	0	0	0
24 Stone mining and quarrying	0	190	31	221
25 Sand- gravel- clay- and refractory min	0	308	51	359
26 Other nonmetallic mineral mining	124	13,758	3,650	17,533
27 Drilling oil and gas wells	0	381	39	420
28 Support activities for oil and gas oper	0	2,729	278	3,007
29 Support activities for other mining	0	-3	3	0
30 Power generation and supply	71,036,184	1,044,040	872,974	72,953,200
31 Natural gas distribution	2,137,687	279,786	429,420	2,846,892
32 Water- sewage and other systems	196,889	85,700	40,783	323,372
33 New residential 1-unit structures- non	0	0	0	0
34 New multifamily housing structures-	0	0	0	0
35 New residential additions and alterati	0	0	0	0
36 New farm housing units and additions	0	0	0	0
37 Manufacturing and industrial building	0	0	0	0
38 Commercial and institutional building	0	0	0	0
39 Highway- street- bridge- and tunnel co	0	0	0	0
40 Water- sewer- and pipeline constructi	0	0	0	0
41 Other new construction	0	0	0	0
42 Maintenance and repair of farm and n	0	932,358	171,117	1,103,475
43 Maintenance and repair of nonresidenti	0	2,161,344	445,274	2,606,619
44 Maintenance and repair of highways- st	0	0	0	0
45 Other maintenance and repair construc	0	2,205,970	95,712	2,301,682
46 Dog and cat food manufacturing	19,156	510	3,245	22,911
47 Other animal food manufacturing	1,217	874	361	2,452
48 Flour milling	12,545	7,467	3,338	23,350
49 Rice milling	0	0	0	0
50 Malt manufacturing	0	0	0	0

Appendix B: Example Output Impact Report

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
51 Wet corn milling	0	0	0	0
52 Soybean processing	0	0	0	0
53 Other oilseed processing	0	0	0	0
54 Fats and oils refining and blending	3,424	2,741	1,040	7,205
55 Breakfast cereal manufacturing	0	0	0	0
56 Sugar manufacturing	6,828	6,473	2,229	15,530
57 Confectionery manufacturing from ca	1,259	170	237	1,665
58 Confectionery manufacturing from pu	16,322	753	2,819	19,894
59 Nonchocolate confectionery manufact	7,494	1,063	1,422	9,980
60 Frozen food manufacturing	110,867	35,066	24,442	170,375
61 Fruit and vegetable canning and dryin	7,882	2,412	1,724	12,017
62 Fluid milk manufacturing	1,198,162	331,095	254,974	1,784,231
63 Creamery butter manufacturing	0	0	0	0
64 Cheese manufacturing	592,686	422,193	171,917	1,186,796
65 Dry- condensed- and evaporated dairy	0	0	0	0
66 Ice cream and frozen dessert manufact	8,410	10,121	3,187	21,718
67 Animal- except poultry- slaughtering	0	0	0	0
68 Meat processed from carcasses	269,167	70,031	56,712	395,910
69 Rendering and meat byproduct proces	71	3,626	659	4,356
70 Poultry processing	95,637	24,423	20,078	140,137
71 Seafood product preparation and pack	2,992	3,503	1,117	7,612
72 Frozen cakes and other pastries manuf	0	0	0	0
73 Bread and bakery product- except fro	1,559,599	665,188	375,587	2,600,374
74 Cookie and cracker manufacturing	13,607	2,086	2,609	18,302
75 Mixes and dough made from purchased	538,683	70,245	100,841	709,768
76 Dry pasta manufacturing	6,723	939	1,274	8,935
77 Tortilla manufacturing	0	0	0	0
78 Roasted nuts and peanut butter manufa	29,416	4,116	5,567	39,099
79 Other snack food manufacturing	768,016	67,948	138,436	974,399
80 Coffee and tea manufacturing	209,250	94,101	51,080	354,431
81 Flavoring syrup and concentrate manu	7,025	153,393	27,986	188,405
82 Mayonnaise- dressing- and sauce manu	243,888	113,838	60,367	418,093
83 Spice and extract manufacturing	498,102	114,680	101,697	714,479
84 All other food manufacturing	131,187	21,845	25,390	178,421
85 Soft drink and ice manufacturing	131,814	26,708	26,433	184,956
86 Breweries	8,775	1,020	1,626	11,421
87 Wineries	3,310	468	628	4,406
88 Distilleries	25,639	5,653	5,233	36,525
89 Tobacco stemming and redrying	0	0	0	0
90 Cigarette manufacturing	0	0	0	0
91 Other tobacco product manufacturing	0	0	0	0
92 Fiber- yarn- and thread mills	0	0	0	0
93 Broadwoven fabric mills	770	583	247	1,600
94 Narrow fabric mills and schiffli embro	31	91	22	144
95 Nonwoven fabric mills	0	0	0	0
96 Knit fabric mills	0	0	0	0
97 Textile and fabric finishing mills	2,287	4,140	1,193	7,619
98 Fabric coating mills	87	455	106	647
99 Carpet and rug mills	2,743	203	541	3,488
100 Curtain and linen mills	10,505	724	2,039	13,269
101 Textile bag and canvas mills	4,877	797	1,060	6,733
102 Tire cord and tire fabric mills	38	29	12	79
103 Other miscellaneous textile product mi	5,420	2,628	1,500	9,548
104 Sheer hosiery mills	0	0	0	0
105 Other hosiery and sock mills	2,443	3	443	2,890
106 Other apparel knitting mills	7,743	195	1,439	9,376
107 Cut and sew apparel manufacturing	816,610	12,047	150,214	978,872
108 Accessories and other apparel manufa	11,561	463	2,192	14,217
109 Leather and hide tanning and finishing	0	0	0	0
110 Footwear manufacturing	0	0	0	0
111 Other leather product manufacturing	15,228	974	2,956	19,159
112 Sawmills	0	5,209	1,063	6,272

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
113 Wood preservation	0	33,010	5,009	38,018
114 Reconstituted wood product manufact	0	0	0	0
115 Veneer and plywood manufacturing	0	0	0	0
116 Engineered wood member and truss ma	0	45,586	7,478	53,064
117 Wood windows and door manufacturi	213	34,443	6,900	41,556
118 Cut stock- resawing lumber- and plani	0	0	0	0
119 Other millwork- including flooring	0	123,413	24,212	147,625
120 Wood container and pallet manufactur	27,287	-12,967	14,500	28,819
121 Manufactured home- mobile home- ma	0	0	0	0
122 Prefabricated wood building manufact	0	395	64	459
123 Miscellaneous wood product manufact	4,330	1,664	1,108	7,102
124 Pulp mills	0	0	0	0
125 Paper and paperboard mills	5	4	2	11
126 Paperboard container manufacturing	13,852	207,281	44,559	265,692
127 Flexible packaging foil manufacturing	535	7,474	1,471	9,481
128 Surface-coated paperboard manufactu	39	4,251	1,062	5,351
129 Coated and laminated paper and packa	41,250	65,183	20,514	126,948
130 Coated and uncoated paper bag manuf	187	342	114	642
131 Die-cut paper office supplies manufac	2	7	2	10
132 Envelope manufacturing	657	1,483	398	2,537
133 Stationery and related product manufa	0	0	0	0
134 Sanitary paper product manufacturing	5,127	1,407	1,120	7,654
135 All other converted paper product man	436	1,613	437	2,487
136 Manifold business forms printing	2,503	19,532	4,274	26,309
137 Books printing	2	282	53	338
138 Blankbook and looseleaf binder manuf	2,426	1,024	657	4,107
139 Commercial printing	62,929	491,049	141,229	695,207
140 Tradebinding and related work	71	3,468	735	4,274
141 Prepress services	401	10,046	2,214	12,661
142 Petroleum refineries	0	0	0	0
143 Asphalt paving mixture and block man	0	84,812	12,724	97,535
144 Asphalt shingle and coating materials	0	153,640	27,126	180,766
145 Petroleum lubricating oil and grease	-165,161	92,391	39,865	-32,905
146 All other petroleum and coal products	-33,332	173	945	-32,214
147 Petrochemical manufacturing	-9,957,091	-886,883	140,423	-10,703,551
148 Industrial gas manufacturing	10,100	159,357	35,204	204,661
149 Synthetic dye and pigment manufactur	248	51,654	12,058	63,959
150 Other basic inorganic chemical manufa	713	68,967	18,361	88,040
151 Other basic organic chemical manufac	27,264	116,363	77,903	221,531
152 Plastics material and resin manufactur	11,996	-79,547	18,463	-49,089
153 Synthetic rubber manufacturing	123	457	195	776
154 Cellulosic organic fiber manufacturing	0	2	1	3
155 Noncellulosic organic fiber manufactu	0	0	0	0
156 Nitrogenous fertilizer manufacturing	1,055	11,661	3,822	16,538
157 Phosphatic fertilizer manufacturing	0	0	0	0
158 Fertilizer- mixing only- manufacturing	53	511	111	675
159 Pesticide and other agricultural chemi	4,152	5,130	1,822	11,104
160 Pharmaceutical and medicine manufac	3,303,613	965,136	644,202	4,912,952
161 Paint and coating manufacturing	1,072	7,301	1,635	10,008
162 Adhesive manufacturing	78,051	112,058	32,767	222,875
163 Soap and other detergent manufacturin	862,165	102,577	169,789	1,134,531
164 Polish and other sanitation good manu	234,864	43,820	49,754	328,437
165 Surface active agent manufacturing	0	0	0	0
166 Toilet preparation manufacturing	1,479,408	105,479	271,863	1,856,750
167 Printing ink manufacturing	1	38,598	9,284	47,883
168 Explosives manufacturing	0	55	17	71
169 Custom compounding of purchased res	35	49,882	9,219	59,135
170 Photographic film and chemical manuf	41,298	71,757	21,286	134,342
171 Other miscellaneous chemical product	69,087	224,965	54,548	348,600
172 Plastics packaging materials- film and	165,032	263,852	88,816	517,700
173 Plastics pipe- fittings- and profile sha	10,971	337,115	56,920	405,007
174 Laminated plastics plate- sheet- and s	2,439	55,486	11,514	69,439

Appendix B: Example Output Impact Report

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
175 Plastics bottle manufacturing	1,945	265,628	46,760	314,333
176 Resilient floor covering manufacturing	0	0	0	0
177 Plastics plumbing fixtures and all othe	388,198	1,070,714	279,374	1,738,286
178 Foam product manufacturing	66,008	397,414	89,157	552,580
179 Tire manufacturing	59	21	15	95
180 Rubber and plastics hose and belting	513	1,998	479	2,990
181 Other rubber product manufacturing	10,608	20,286	6,024	36,918
182 Vitreous china plumbing fixture manuf	0	0	0	0
183 Vitreous china and earthenware articl	742	45	153	940
184 Porcelain electrical supply manufactur	0	0	0	0
185 Brick and structural clay tile manufac	0	0	0	0
186 Ceramic wall and floor tile manufactu	0	0	0	0
187 Nonclay refractory manufacturing	0	3	0	3
188 Clay refractory and other structural c	0	0	0	0
189 Glass container manufacturing	0	0	0	0
190 Glass and glass products- except glass	16,482	49,147	12,077	77,706
191 Cement manufacturing	0	4	0	5
192 Ready-mix concrete manufacturing	0	7,181	1,113	8,294
193 Concrete block and brick manufacturi	0	92	14	107
194 Concrete pipe manufacturing	0	0	0	0
195 Other concrete product manufacturing	30	3,343	405	3,778
196 Lime manufacturing	0	77	14	90
197 Gypsum product manufacturing	1	88	15	105
198 Abrasive product manufacturing	1,313	1,505	491	3,309
199 Cut stone and stone product manufact	213	16	33	262
200 Ground or treated minerals and earths	1	6	1	8
201 Mineral wool manufacturing	1,284	7,847	1,757	10,889
202 Miscellaneous nonmetallic mineral pr	190	1,919	385	2,493
203 Iron and steel mills	4,792	108,211	19,805	132,807
204 Ferroalloy and related product manufa	0	0	0	0
205 Iron- steel pipe and tube from purchas	22	1,322	236	1,581
206 Rolled steel shape manufacturing	1,493	41,715	7,581	50,789
207 Steel wire drawing	11,923	17,412	4,984	34,318
208 Alumina refining	0	0	0	0
209 Primary aluminum production	0	53	11	63
210 Secondary smelting and alloying of a	0	1,783	358	2,141
211 Aluminum sheet- plate- and foil manuf	0	552	106	659
212 Aluminum extruded product manufact	0	66	13	78
213 Other aluminum rolling and drawing	10	1,920	360	2,290
214 Primary smelting and refining of copp	0	0	0	0
215 Primary nonferrous metal- except cop	0	286	59	345
216 Copper rolling- drawing- and extrudin	4	5,664	878	6,546
217 Copper wire- except mechanical- draw	5	60	9	75
218 Secondary processing of copper	0	339	58	398
219 Nonferrous metal- except copper and	495	4,463	556	5,514
220 Secondary processing of other nonferr	55	2,452	479	2,986
221 Ferrous metal foundaries	4	1,595	307	1,906
222 Aluminum foundries	117	22,012	4,157	26,287
223 Nonferrous foundries- except alumin	70	13,195	2,492	15,757
224 Iron and steel forging	170	4,657	900	5,727
225 Nonferrous forging	0	2,239	414	2,652
226 Custom roll forming	5	797	158	960
227 All other forging and stamping	4,184	18,884	4,096	27,164
228 Cutlery and flatware- except precious	0	0	0	0
229 Hand and edge tool manufacturing	66,792	39,484	19,748	126,024
230 Saw blade and handsaw manufacturin	1,770	1,046	516	3,331
231 Kitchen utensil- pot- and pan manufac	10,338	948	2,053	13,340
232 Prefabricated metal buildings and co	40	185	33	258
233 Fabricated structural metal manufactu	0	2,426	384	2,810
234 Plate work manufacturing	0	3,478	586	4,064
235 Metal window and door manufacturing	515	1,933	459	2,908
236 Sheet metal work manufacturing	30	9,353	1,824	11,207

Appendix B: Example Output Impact Report

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
237 Ornamental and architectural metal w	9	1,691	284	1,984
238 Power boiler and heat exchanger manu	0	320	54	375
239 Metal tank- heavy gauge- manufacturi	0	2	1	3
240 Metal can- box- and other container m	5,252	26,501	7,847	39,600
241 Hardware manufacturing	12,695	35,441	9,325	57,461
242 Spring and wire product manufacturin	21,604	99,300	22,228	143,132
243 Machine shops	217	318,077	51,791	370,085
244 Turned product and screw- nut- and b	14,697	141,113	25,246	181,057
245 Metal heat treating	0	20,864	3,127	23,991
246 Metal coating and nonprecious engrav	116	28,924	4,412	33,452
247 Electroplating- anodizing- and colorin	0	73,572	10,713	84,285
248 Metal valve manufacturing	0	73,553	17,534	91,087
249 Ball and roller bearing manufacturing	0	14,260	2,781	17,041
250 Small arms manufacturing	0	0	0	0
251 Other ordnance and accessories manuf	0	0	0	0
252 Fabricated pipe and pipe fitting manuf	0	12,635	2,500	15,135
253 Industrial pattern manufacturing	0	1,362	225	1,587
254 Enameled iron and metal sanitary war	4	16	4	23
255 Miscellaneous fabricated metal produ	38	1,009	204	1,251
256 Ammunition manufacturing	7	3	2	12
257 Farm machinery and equipment manufa	0	7,174	1,283	8,458
258 Lawn and garden equipment manufactu	66,357	111,178	33,068	210,602
259 Construction machinery manufacturin	646	14,337	1,841	16,824
260 Mining machinery and equipment manu	0	224	32	256
261 Oil and gas field machinery and equi	0	0	0	0
262 Sawmill and woodworking machinery	14,059	671	2,730	17,459
263 Plastics and rubber industry machiner	29	3,360	680	4,069
264 Paper industry machinery manufacturi	0	699	135	835
265 Textile machinery manufacturing	0	113	19	133
266 Printing machinery and equipment man	11	1,152	315	1,478
267 Food product machinery manufacturin	94	14,001	2,879	16,975
268 Semiconductor machinery manufacturi	0	0	0	0
269 All other industrial machinery manufa	23,363	2,413	6,166	31,942
270 Office machinery manufacturing	1,331	331	328	1,990
271 Optical instrument and lens manufactu	10,827	6,787	3,257	20,871
272 Photographic and photocopying equip	5,312	867	1,172	7,351
273 Other commercial and service industr	97	21,283	4,171	25,550
274 Automatic vending- commercial laund	14	14,622	2,940	17,576
275 Air purification equipment manufactur	0	14	3	17
276 Industrial and commercial fan and bl	35	271	49	354
277 Heating equipment- except warm air f	0	0	0	1
278 AC- refrigeration- and forced air heati	0	1	0	1
279 Industrial mold manufacturing	941	4,312	961	6,214
280 Metal cutting machine tool manufactur	3,907	1,161	933	6,000
281 Metal forming machine tool manufactu	96	1,340	278	1,714
282 Special tool- die- jig- and fixture man	402	16,786	3,113	20,301
283 Cutting tool and machine tool accesso	68	25,442	5,326	30,836
284 Rolling mill and other metalworking m	16	1,442	257	1,716
285 Turbine and turbine generator set unit	0	0	0	0
286 Other engine equipment manufacturin	49,490	194,736	46,265	290,490
287 Speed changers and mechanical power	1,372	26,171	5,207	32,750
288 Pump and pumping equipment manufac	0	241	46	287
289 Air and gas compressor manufacturin	0	15,615	578	16,192
290 Measuring and dispensing pump manuf	0	113	25	138
291 Elevator and moving stairway manufac	0	1,508	278	1,786
292 Conveyor and conveying equipment m	0	3,924	652	4,576
293 Overhead cranes- hoists- and monorai	0	377	37	415
294 Industrial truck- trailer- and stacker m	501	3,596	1,076	5,172
295 Power-driven handtool manufacturing	48,910	5,993	9,937	64,840
296 Welding and soldering equipment man	9,016	12,128	3,385	24,529
297 Packaging machinery manufacturing	0	12,015	2,165	14,180
298 Industrial process furnace and oven m	201	814	210	1,225

Appendix B: Example Output Impact Report

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
299 Fluid power cylinder and actuator man	9	292	62	363
300 Fluid power pump and motor manufact	2	6	2	10
301 Scales- balances- and miscellaneous g	80	401	87	569
302 Electronic computer manufacturing	436,520	52,033	88,382	576,936
303 Computer storage device manufacturi	37,736	37,099	13,525	88,361
304 Computer terminal manufacturing	0	0	0	0
305 Other computer peripheral equipment	31,181	8,264	7,125	46,570
306 Telephone apparatus manufacturing	20,199	12,873	6,113	39,184
307 Broadcast and wireless communicatio	55,640	13,455	12,491	81,586
308 Other communications equipment manu	113	11,838	2,274	14,225
309 Audio and video equipment manufactu	52,067	3,730	9,613	65,410
310 Electron tube manufacturing	257	7,545	1,444	9,246
311 Semiconductors and related device ma	33	38,014	9,768	47,815
312 All other electronic component manufa	47,236	177,749	46,220	271,204
313 Electromedical apparatus manufacturi	10,274	28,358	6,381	45,013
314 Search- detection- and navigation inst	1,397	415	337	2,149
315 Automatic environmental control manu	0	11,614	2,430	14,045
316 Industrial process variable instrument	10,816	15,623	7,320	33,758
317 Totalizing fluid meters and counting d	0	3,255	601	3,856
318 Electricity and signal testing instrumen	2,987	15,250	3,588	21,825
319 Analytical laboratory instrument manu	653	3,507	703	4,863
320 Irradiation apparatus manufacturing	1,306	23,949	4,062	29,317
321 Watch- clock- and other measuring and	112,070	12,388	23,416	147,875
322 Software reproducing	0	95,586	24,108	119,694
323 Audio and video media reproduction	14	6,387	1,475	7,876
324 Magnetic and optical recording media	605	840	280	1,724
325 Electric lamp bulb and part manufactu	107	121	30	258
326 Lighting fixture manufacturing	380	191	102	674
327 Electric housewares and household fa	200	19	39	258
328 Household vacuum cleaner manufactu	12,392	278	2,206	14,875
329 Household cooking appliance manufac	0	0	0	0
330 Household refrigerator and home free	0	0	0	0
331 Household laundry equipment manufac	0	0	0	0
332 Other major household appliance manu	0	0	0	0
333 Electric power and specialty transfor	606	-654	1,703	1,655
334 Motor and generator manufacturing	4,654	33,788	6,117	44,559
335 Switchgear and switchboard apparatus	1,787	31,353	3,058	36,198
336 Relay and industrial control manufactu	139	54,242	7,612	61,993
337 Storage battery manufacturing	33,312	14,854	7,729	55,894
338 Primary battery manufacturing	220,758	6,444	39,007	266,209
339 Fiber optic cable manufacturing	0	0	0	0
340 Other communication and energy wire	31	12,595	1,446	14,073
341 Wiring device manufacturing	115	2,468	439	3,023
342 Carbon and graphite product manufact	1,278	5,515	1,566	8,359
343 Miscellaneous electrical equipment m	36,587	6,203	7,668	50,458
344 Automobile and light truck manufactu	7,363,640	49,691	1,355,725	8,769,056
345 Heavy duty truck manufacturing	0	0	0	0
346 Motor vehicle body manufacturing	7,796	42,973	9,346	60,115
347 Truck trailer manufacturing	0	0	0	0
348 Motor home manufacturing	0	0	0	0
349 Travel trailer and camper manufacturi	142,772	5,594	27,589	175,956
350 Motor vehicle parts manufacturing	606,878	4,560,141	977,270	6,144,289
351 Aircraft manufacturing	658	100	140	898
352 Aircraft engine and engine parts manu	5,952	86,830	5,470	98,252
353 Other aircraft parts and equipment	14,869	4,820	3,742	23,431
354 Guided missile and space vehicle man	0	0	0	0
355 Propulsion units and parts for space v	0	0	0	0
356 Railroad rolling stock manufacturing	4	5	9	18
357 Ship building and repairing	0	-341	53	-289
358 Boat building	6,455	3	1,196	7,653
359 Motorcycle- bicycle- and parts manufa	6,953	5,029	2,235	14,218
360 Military armored vehicles and tank pa	1,364	3	250	1,617

Appendix B: Example Output Impact Report

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
361 All other transportation equipment ma	872	112	180	1,164
362 Wood kitchen cabinet and countertop	82,978	312,457	72,218	467,653
363 Upholstered household furniture manu	34,748	6	6,512	41,266
364 Nonupholstered wood household furni	130,394	643	24,549	155,585
365 Metal household furniture manufactur	31,044	13	5,819	36,876
366 Institutional furniture manufacturing	485	558	195	1,238
367 Other household and institutional furni	10,996	1,598	2,354	14,948
368 Wood office furniture manufacturing	5,268	1,469	1,269	8,005
369 Custom architectural woodwork and m	0	3,909	717	4,626
370 Office furniture- except wood- manufa	17	70	32	119
371 Showcases- partitions- shelving- and l	44	12,576	2,361	14,981
372 Mattress manufacturing	501,694	2,515	94,469	598,678
373 Blind and shade manufacturing	25,050	26	4,596	29,671
374 Laboratory apparatus and furniture ma	4,830	6,130	1,851	12,811
375 Surgical and medical instrument manu	31,856	666,787	117,974	816,617
376 Surgical appliance and supplies manuf	559,011	523,002	177,628	1,259,641
377 Dental equipment and supplies manufa	57	16,828	2,916	19,800
378 Ophthalmic goods manufacturing	418,305	5,422	72,764	496,491
379 Dental laboratories	0	222,164	38,400	260,564
380 Jewelry and silverware manufacturing	6,203	109	1,226	7,538
381 Sporting and athletic goods manufactu	268	150	70	489
382 Doll- toy- and game manufacturing	939	38	174	1,151
383 Office supplies- except paper- manufa	863	357	236	1,456
384 Sign manufacturing	623	40,618	13,117	54,359
385 Gasket- packing- and sealing device	282	842	218	1,342
386 Musical instrument manufacturing	201	6	36	243
387 Broom- brush- and mop manufacturing	14,586	9,410	4,485	28,480
388 Burial casket manufacturing	0	7	1	8
389 Buttons- pins- and all other miscella	9,669	6,329	2,950	18,948
390 Wholesale trade	-14,163,451	594,759	520,334	-13,048,358
391 Air transportation	753,536	199,467	179,873	1,132,876
392 Rail transportation	-2,124,755	1,426,432	92,692	-605,632
393 Water transportation	-1,590,664	253,817	199,236	-1,137,612
394 Truck transportation	-756,185	1,341,468	755,308	1,340,592
395 Transit and ground passenger transpor	256,975	60,428	56,165	373,568
396 Pipeline transportation	-518,063	542,380	24,563	48,879
397 Scenic and sightseeing transportation	-19,156	-6,794	85,332	59,382
398 Postal service	326,545	1,249,330	313,957	1,889,832
399 Couriers and messengers	0	619,224	166,775	785,999
400 Warehousing and storage	33,603	220,451	132,354	386,407
401 Motor vehicle and parts dealers	12,015,814	323,778	2,154,148	14,493,740
402 Furniture and home furnishings stores	3,014,161	107,111	546,185	3,667,457
403 Electronics and appliance stores	2,551,725	79,052	459,776	3,090,553
404 Building material and garden supply s	5,039,302	136,265	903,534	6,079,101
405 Food and beverage stores	11,524,103	318,965	2,067,892	13,910,960
406 Health and personal care stores	4,965,479	141,300	891,878	5,998,656
407 Gasoline stations	-85,933,368	86,144	483,802	-85,363,424
408 Clothing and clothing accessories stor	4,783,746	132,911	858,512	5,775,169
409 Sporting goods- hobby- book and musi	1,877,532	51,353	336,768	2,265,652
410 General merchandise stores	7,078,280	191,177	1,269,069	8,538,525
411 Miscellaneous store retailers	3,960,284	111,925	711,156	4,783,364
412 Nonstore retailers	3,761,119	101,454	674,304	4,536,876
413 Newspaper publishers	127,145	395,786	149,290	672,220
414 Periodical publishers	199,187	219,060	99,780	518,027
415 Book publishers	253,860	46,102	53,437	353,398
416 Database- directory- and other publish	91,075	335,794	120,048	546,917
417 Software publishers	46,140	5,259	9,429	60,829
418 Motion picture and video industries	632,455	449,559	204,218	1,286,232
419 Sound recording industries	181,468	28,613	36,505	246,586
420 Radio and television broadcasting	183,810	411,112	155,763	750,684
421 Cable networks and program distribut	617,411	42,176	123,647	783,235
422 Telecommunications	7,435,348	2,427,551	1,747,918	11,610,817

Appendix B: Example Output Impact Report

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
423 Information services	77,968	58,422	27,142	163,532
424 Data processing services	695	202,050	47,729	250,474
425 Nondepository credit intermediation an	2,137,564	2,367,922	923,721	5,429,207
426 Securities- commodity contracts- inve	3,029,002	3,258,315	1,107,289	7,394,606
427 Insurance carriers	9,121,309	2,941,714	2,255,659	14,318,682
428 Insurance agencies- brokerages- and r	0	2,825,495	528,786	3,354,280
429 Funds- trusts- and other financial vehi	3,677,390	71,407	739,925	4,488,722
430 Monetary authorities and depository c	10,632,145	2,558,272	2,279,163	15,469,580
431 Real estate	14,528,725	12,896,783	4,828,447	32,253,954
432 Automotive equipment rental and leas	2,150,339	515,998	506,066	3,172,403
433 Video tape and disc rental	630,025	1,015	116,897	747,937
434 Machinery and equipment rental and l	6,625	120,151	29,075	155,851
435 General and consumer goods rental ex	699,607	161,975	165,821	1,027,403
436 Lessors of nonfinancial intangible asse	0	528,380	115,026	643,406
437 Legal services	4,605,007	3,576,137	1,349,271	9,530,415
438 Accounting and bookkeeping services	448,684	1,664,294	435,854	2,548,831
439 Architectural and engineering services	6,336	1,357,702	258,785	1,622,823
440 Specialized design services	105,372	244,345	75,887	425,604
441 Custom computer programming servic	2,299	185,164	37,748	225,211
442 Computer systems design services	19,289	270,106	61,243	350,639
443 Other computer related services- includ	23,508	435,927	87,216	546,652
444 Management consulting services	81,883	1,662,152	371,274	2,115,308
445 Environmental and other technical cons	79	161,958	56,893	218,929
446 Scientific research and development s	177,499	380,826	114,845	673,170
447 Advertising and related services	16,094	840,942	273,288	1,130,324
448 Photographic services	383,952	67,915	85,639	537,506
449 Veterinary services	1,211,091	45,016	231,982	1,488,090
450 All other miscellaneous professional a	0	1,370,094	229,247	1,599,341
451 Management of companies and enterpr	0	1,711,935	823,030	2,534,965
452 Office administrative services	2,182	1,079,069	218,166	1,299,418
453 Facilities support services	77	27,900	5,636	33,613
454 Employment services	32,340	1,696,131	343,469	2,071,940
455 Business support services	149,210	1,140,757	266,272	1,556,240
456 Travel arrangement and reservation se	419,540	154,720	120,859	695,119
457 Investigation and security services	83,658	422,500	103,436	609,593
458 Services to buildings and dwellings	335,084	2,127,933	469,496	2,932,514
459 Other support services	28,156	653,566	163,309	845,030
460 Waste management and remediation se	400,461	640,997	180,490	1,221,948
461 Elementary and secondary schools	1,874,185	0	387,304	2,261,489
462 Colleges- universities- and junior coll	5,217,579	177,739	986,182	6,381,499
463 Other educational services	2,291,923	133,886	458,137	2,883,946
464 Home health care services	3,821,233	0	650,982	4,472,216
465 Offices of physicians- dentists- and ot	27,864,648	0	4,819,213	32,683,860
466 Other ambulatory health care services	7,518,187	489,760	1,363,475	9,371,421
467 Hospitals	34,103,600	0	5,762,352	39,865,952
468 Nursing and residential care facilities	9,401,152	0	1,608,458	11,009,610
469 Child day care services	3,461,899	0	643,335	4,105,234
470 Social assistance- except child day ca	4,226,786	218	769,213	4,996,217
471 Performing arts companies	424,677	145,217	103,265	673,158
472 Spectator sports	773,053	214,322	182,542	1,169,917
473 Independent artists- writers- and perf	2,482	127,688	26,067	156,237
474 Promoters of performing arts and spor	493,597	197,449	134,472	825,519
475 Museums- historical sites- zoos- and	525,533	0	95,691	621,224
476 Fitness and recreational sports centers	1,059,992	53,289	198,871	1,312,152
477 Bowling centers	191,736	2,488	38,200	232,425
478 Other amusement- gambling- and recrea	4,491,152	46,956	830,687	5,368,796
479 Hotels and motels- including casino ho	1,471,745	283,320	337,852	2,092,917
480 Other accommodations	532,023	7,123	102,657	641,803
481 Food services and drinking places	27,787,888	2,211,814	5,360,847	35,360,548
482 Car washes	560,665	34,171	110,805	705,641
483 Automotive repair and maintenance- e	8,060,131	687,833	1,614,863	10,362,826
484 Electronic equipment repair and main	40,161	454,564	114,852	609,577

Appendix B: Example Output Impact Report

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
485 Commercial machinery repair and mai	0	412,027	101,023	513,050
486 Household goods repair and maintena	834,012	256,736	208,220	1,298,969
487 Personal care services	2,972,818	52,970	523,340	3,549,128
488 Death care services	1,062,525	0	152,019	1,214,543
489 Drycleaning and laundry services	1,023,422	355,530	255,253	1,634,204
490 Other personal services	2,876,476	84,521	552,577	3,513,574
491 Religious organizations	1,190,484	0	216,633	1,407,117
492 Grantmaking and giving and social ad	1,591,348	0	289,732	1,881,080
493 Civic- social- professional and similar	2,278,281	972,172	596,522	3,846,975
494 Private households	1,203,661	0	225,133	1,428,794
495 Federal electric utilities	0	0	0	0
496 Other Federal Government enterprises	14,537	36,985	25,057	76,579
497 State and local government passenger t	451,505	106,172	98,682	656,360
498 State and local government electric uti	16,869,876	234,396	188,198	17,292,470
499 Other State and local government ente	6,365,051	1,940,326	1,394,769	9,700,146
500 Noncomparable imports	0	0	0	0
501 Scrap	0	0	0	0
502 Used and secondhand goods	0	0	0	0
503 State & Local Education	0	0	0	0
504 State & Local Non-Education	0	0	0	0
505 Federal Military	0	0	0	0
506 Federal Non-Military	0	0	0	0
507 Rest of the world adjustment to final	0	0	0	0
508 Inventory valuation adjustment	0	0	0	0
509 Owner-occupied dwellings	65,003,036	0	12,108,496	77,111,536
11001 Federal Government NonDefense	5,937	0	0	5,937
12001 State/Local Govt NonEducation	12,091,170	0	0	12,091,170
12003 State/Local Govt Investment	58,395	0	0	58,395
14001 Capital	1,190,770	0	0	1,190,770
14002 Inventory Additions/Deletions	10,896	0	0	10,896
25001 Foreign Trade	11,076,120	0	0	11,076,120
28001 Domestic Trade	-63,367,680	0	0	-63,367,680
Total	\$320,052,058	\$101,244,333	90,681,202	\$511,977,596

C

APPENDIX C: EXAMPLE EMPLOYMENT IMPACTS

IMPACT: Cleveland Case IV Approach A Net Impacts

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
1 Oilseed farming	0.0	0.0	0.0	0.0
2 Grain farming	0.1	0.3	0.1	0.5
3 Vegetable and melon farming	0.5	0.1	0.1	0.7
4 Tree nut farming	0.0	0.0	0.0	0.0
5 Fruit farming	0.4	0.1	0.1	0.6
6 Greenhouse and nursery production	7.8	1.7	1.7	11.2
7 Tobacco farming	0.0	0.0	0.0	0.0
8 Cotton farming	0.0	0.0	0.0	0.0
9 Sugarcane and sugar beet farming	0.0	0.0	0.0	0.0
10 All other crop farming	0.0	0.2	0.0	0.2
11 Cattle ranching and farming	0.1	3.7	0.6	4.4
12 Poultry and egg production	0.1	0.0	0.0	0.1
13 Animal production- except cattle and	3.6	1.6	0.9	6.1
14 Logging	0.0	0.1	0.0	0.1
15 Forest nurseries- forest products- and	0.0	0.0	0.0	0.0
16 Fishing	0.0	0.0	0.0	0.0
17 Hunting and trapping	0.3	0.0	0.1	0.4
18 Agriculture and forestry support activi	0.9	0.7	0.3	1.9
19 Oil and gas extraction	-14.7	27.5	1.3	14.2
20 Coal mining	0.0	0.0	0.0	0.0
21 Iron ore mining	0.0	0.0	0.0	0.0
22 Copper- nickel- lead- and zinc mining	0.0	0.0	0.0	0.0
23 Gold- silver- and other metal ore mini	0.0	0.0	0.0	0.0
24 Stone mining and quarrying	0.0	0.0	0.0	0.0
25 Sand- gravel- clay- and refractory min	0.0	0.0	0.0	0.0
26 Other nonmetallic mineral mining	0.0	0.1	0.0	0.1
27 Drilling oil and gas wells	0.0	0.0	0.0	0.0
28 Support activities for oil and gas oper	0.0	0.0	0.0	0.0
29 Support activities for other mining	0.0	0.0	0.0	0.0
30 Power generation and supply	158.5	2.3	1.9	162.7
31 Natural gas distribution	3.2	0.4	0.6	4.3
32 Water- sewage and other systems	1.3	0.6	0.3	2.2
33 New residential 1-unit structures- non	0.0	0.0	0.0	0.0
34 New multifamily housing structures-	0.0	0.0	0.0	0.0
35 New residential additions and alterati	0.0	0.0	0.0	0.0
36 New farm housing units and additions	0.0	0.0	0.0	0.0
37 Manufacturing and industrial building	0.0	0.0	0.0	0.0
38 Commercial and institutional building	0.0	0.0	0.0	0.0
39 Highway- street- bridge- and tunnel co	0.0	0.0	0.0	0.0
40 Water- sewer- and pipeline constructi	0.0	0.0	0.0	0.0
41 Other new construction	0.0	0.0	0.0	0.0
42 Maintenance and repair of farm and n	0.0	5.5	1.0	6.5
43 Maintenance and repair of nonresidenti	0.0	22.2	4.6	26.8
44 Maintenance and repair of highways- st	0.0	0.0	0.0	0.0
45 Other maintenance and repair construc	0.0	29.6	1.3	30.9
46 Dog and cat food manufacturing	0.0	0.0	0.0	0.0
47 Other animal food manufacturing	0.0	0.0	0.0	0.0

Appendix C: Example Employment Impacts

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
48 Flour milling	0.0	0.0	0.0	0.0
49 Rice milling	0.0	0.0	0.0	0.0
50 Malt manufacturing	0.0	0.0	0.0	0.0
51 Wet corn milling	0.0	0.0	0.0	0.0
52 Soybean processing	0.0	0.0	0.0	0.0
53 Other oilseed processing	0.0	0.0	0.0	0.0
54 Fats and oils refining and blending	0.0	0.0	0.0	0.0
55 Breakfast cereal manufacturing	0.0	0.0	0.0	0.0
56 Sugar manufacturing	0.0	0.0	0.0	0.0
57 Confectionery manufacturing from ca	0.0	0.0	0.0	0.0
58 Confectionery manufacturing from pu	0.1	0.0	0.0	0.1
59 Nonchocolate confectionery manufact	0.0	0.0	0.0	0.0
60 Frozen food manufacturing	0.3	0.1	0.1	0.5
61 Fruit and vegetable canning and dryin	0.0	0.0	0.0	0.0
62 Fluid milk manufacturing	2.2	0.6	0.5	3.3
63 Creamery butter manufacturing	0.0	0.0	0.0	0.0
64 Cheese manufacturing	0.9	0.6	0.3	1.8
65 Dry- condensed- and evaporated dairy	0.0	0.0	0.0	0.0
66 Ice cream and frozen dessert manufact	0.0	0.0	0.0	0.1
67 Animal- except poultry- slaughtering	0.0	0.0	0.0	0.0
68 Meat processed from carcasses	0.8	0.2	0.2	1.2
69 Rendering and meat byproduct proces	0.0	0.0	0.0	0.0
70 Poultry processing	0.5	0.1	0.1	0.8
71 Seafood product preparation and pack	0.0	0.0	0.0	0.0
72 Frozen cakes and other pastries manuf	0.0	0.0	0.0	0.0
73 Bread and bakery product- except fro	13.5	5.7	3.2	22.5
74 Cookie and cracker manufacturing	0.1	0.0	0.0	0.1
75 Mixes and dough made from purchased	1.4	0.2	0.3	1.8
76 Dry pasta manufacturing	0.0	0.0	0.0	0.0
77 Tortilla manufacturing	0.0	0.0	0.0	0.0
78 Roasted nuts and peanut butter manufa	0.1	0.0	0.0	0.1
79 Other snack food manufacturing	1.8	0.2	0.3	2.3
80 Coffee and tea manufacturing	0.4	0.2	0.1	0.8
81 Flavoring syrup and concentrate manu	0.0	0.1	0.0	0.1
82 Mayonnaise- dressing- and sauce manu	0.7	0.3	0.2	1.2
83 Spice and extract manufacturing	1.0	0.2	0.2	1.4
84 All other food manufacturing	0.6	0.1	0.1	0.8
85 Soft drink and ice manufacturing	0.3	0.1	0.1	0.4
86 Breweries	0.0	0.0	0.0	0.0
87 Wineries	0.0	0.0	0.0	0.0
88 Distilleries	0.0	0.0	0.0	0.0
89 Tobacco stemming and redrying	0.0	0.0	0.0	0.0
90 Cigarette manufacturing	0.0	0.0	0.0	0.0
91 Other tobacco product manufacturing	0.0	0.0	0.0	0.0
92 Fiber- yarn- and thread mills	0.0	0.0	0.0	0.0
93 Broadwoven fabric mills	0.0	0.0	0.0	0.0
94 Narrow fabric mills and schiffli embro	0.0	0.0	0.0	0.0
95 Nonwoven fabric mills	0.0	0.0	0.0	0.0
96 Knit fabric mills	0.0	0.0	0.0	0.0
97 Textile and fabric finishing mills	0.0	0.0	0.0	0.0
98 Fabric coating mills	0.0	0.0	0.0	0.0
99 Carpet and rug mills	0.0	0.0	0.0	0.0
100 Curtain and linen mills	0.1	0.0	0.0	0.1
101 Textile bag and canvas mills	0.0	0.0	0.0	0.1
102 Tire cord and tire fabric mills	0.0	0.0	0.0	0.0
103 Other miscellaneous textile product mi	0.0	0.0	0.0	0.1
104 Sheer hosiery mills	0.0	0.0	0.0	0.0
105 Other hosiery and sock mills	0.0	0.0	0.0	0.0
106 Other apparel knitting mills	0.1	0.0	0.0	0.1
107 Cut and sew apparel manufacturing	6.8	0.1	1.3	8.2
108 Accessories and other apparel manufa	0.2	0.0	0.0	0.2
109 Leather and hide tanning and finishing	0.0	0.0	0.0	0.0

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
110 Footwear manufacturing	0.0	0.0	0.0	0.0
111 Other leather product manufacturing	0.8	0.0	0.1	1.0
112 Sawmills	0.0	0.0	0.0	0.0
113 Wood preservation	0.0	0.1	0.0	0.2
114 Reconstituted wood product manufact	0.0	0.0	0.0	0.0
115 Veneer and plywood manufacturing	0.0	0.0	0.0	0.0
116 Engineered wood member and truss ma	0.0	0.3	0.0	0.3
117 Wood windows and door manufacturi	0.0	0.2	0.0	0.2
118 Cut stock- resawing lumber- and plani	0.0	0.0	0.0	0.0
119 Other millwork- including flooring	0.0	0.8	0.2	1.0
120 Wood container and pallet manufactur	0.3	-0.1	0.2	0.3
121 Manufactured home- mobile home- ma	0.0	0.0	0.0	0.0
122 Prefabricated wood building manufact	0.0	0.0	0.0	0.0
123 Miscellaneous wood product manufact	0.0	0.0	0.0	0.1
124 Pulp mills	0.0	0.0	0.0	0.0
125 Paper and paperboard mills	0.0	0.0	0.0	0.0
126 Paperboard container manufacturing	0.1	0.8	0.2	1.0
127 Flexible packaging foil manufacturing	0.0	0.0	0.0	0.0
128 Surface-coated paperboard manufactu	0.0	0.0	0.0	0.0
129 Coated and laminated paper and packa	0.1	0.2	0.1	0.4
130 Coated and uncoated paper bag manuf	0.0	0.0	0.0	0.0
131 Die-cut paper office supplies manufac	0.0	0.0	0.0	0.0
132 Envelope manufacturing	0.0	0.0	0.0	0.0
133 Stationery and related product manufa	0.0	0.0	0.0	0.0
134 Sanitary paper product manufacturing	0.0	0.0	0.0	0.0
135 All other converted paper product man	0.0	0.0	0.0	0.0
136 Manifold business forms printing	0.0	0.1	0.0	0.2
137 Books printing	0.0	0.0	0.0	0.0
138 Blankbook and looseleaf binder manuf	0.0	0.0	0.0	0.0
139 Commercial printing	0.9	6.7	1.9	9.5
140 Tradebinding and related work	0.0	0.1	0.0	0.1
141 Prepress services	0.0	0.1	0.0	0.1
142 Petroleum refineries	0.0	0.0	0.0	0.0
143 Asphalt paving mixture and block man	0.0	0.2	0.0	0.2
144 Asphalt shingle and coating materials	0.0	0.3	0.0	0.3
145 Petroleum lubricating oil and grease	-0.2	0.1	0.1	0.0
146 All other petroleum and coal products	-0.1	0.0	0.0	-0.1
147 Petrochemical manufacturing	-3.5	-0.3	0.0	-3.8
148 Industrial gas manufacturing	0.0	0.2	0.0	0.3
149 Synthetic dye and pigment manufactur	0.0	0.1	0.0	0.1
150 Other basic inorganic chemical manufa	0.0	0.2	0.0	0.2
151 Other basic organic chemical manufac	0.0	0.1	0.1	0.3
152 Plastics material and resin manufactur	0.0	-0.1	0.0	-0.1
153 Synthetic rubber manufacturing	0.0	0.0	0.0	0.0
154 Cellulosic organic fiber manufacturing	0.0	0.0	0.0	0.0
155 Noncellulosic organic fiber manufactu	0.0	0.0	0.0	0.0
156 Nitrogenous fertilizer manufacturing	0.0	0.0	0.0	0.0
157 Phosphatic fertilizer manufacturing	0.0	0.0	0.0	0.0
158 Fertilizer- mixing only- manufacturing	0.0	0.0	0.0	0.0
159 Pesticide and other agricultural chemi	0.0	0.0	0.0	0.0
160 Pharmaceutical and medicine manufac	5.8	1.7	1.1	8.6
161 Paint and coating manufacturing	0.0	0.0	0.0	0.0
162 Adhesive manufacturing	0.2	0.3	0.1	0.5
163 Soap and other detergent manufacturin	1.2	0.1	0.2	1.6
164 Polish and other sanitation good manu	0.7	0.1	0.1	1.0
165 Surface active agent manufacturing	0.0	0.0	0.0	0.0
166 Toilet preparation manufacturing	3.3	0.2	0.6	4.1
167 Printing ink manufacturing	0.0	0.1	0.0	0.1
168 Explosives manufacturing	0.0	0.0	0.0	0.0
169 Custom compounding of purchased res	0.0	0.2	0.0	0.2
170 Photographic film and chemical manuf	0.1	0.2	0.1	0.4
171 Other miscellaneous chemical product	0.2	0.6	0.1	0.9

Appendix C: Example Employment Impacts

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
172 Plastics packaging materials- film and	0.6	1.0	0.3	1.9
173 Plastics pipe- fittings- and profile sha	0.0	1.3	0.2	1.6
174 Laminated plastics plate- sheet- and s	0.0	0.3	0.1	0.3
175 Plastics bottle manufacturing	0.0	1.1	0.2	1.3
176 Resilient floor covering manufacturing	0.0	0.0	0.0	0.0
177 Plastics plumbing fixtures and all othe	2.3	6.3	1.6	10.3
178 Foam product manufacturing	0.3	1.6	0.4	2.2
179 Tire manufacturing	0.0	0.0	0.0	0.0
180 Rubber and plastics hose and belting	0.0	0.0	0.0	0.0
181 Other rubber product manufacturing	0.1	0.1	0.0	0.2
182 Vitreous china plumbing fixture manuf	0.0	0.0	0.0	0.0
183 Vitreous china and earthenware articl	0.0	0.0	0.0	0.0
184 Porcelain electrical supply manufactur	0.0	0.0	0.0	0.0
185 Brick and structural clay tile manufac	0.0	0.0	0.0	0.0
186 Ceramic wall and floor tile manufactu	0.0	0.0	0.0	0.0
187 Nonclay refractory manufacturing	0.0	0.0	0.0	0.0
188 Clay refractory and other structural c	0.0	0.0	0.0	0.0
189 Glass container manufacturing	0.0	0.0	0.0	0.0
190 Glass and glass products- except glass	0.1	0.2	0.1	0.4
191 Cement manufacturing	0.0	0.0	0.0	0.0
192 Ready-mix concrete manufacturing	0.0	0.0	0.0	0.0
193 Concrete block and brick manufacturi	0.0	0.0	0.0	0.0
194 Concrete pipe manufacturing	0.0	0.0	0.0	0.0
195 Other concrete product manufacturing	0.0	0.0	0.0	0.0
196 Lime manufacturing	0.0	0.0	0.0	0.0
197 Gypsum product manufacturing	0.0	0.0	0.0	0.0
198 Abrasive product manufacturing	0.0	0.0	0.0	0.0
199 Cut stone and stone product manufact	0.0	0.0	0.0	0.0
200 Ground or treated minerals and earths	0.0	0.0	0.0	0.0
201 Mineral wool manufacturing	0.0	0.0	0.0	0.0
202 Miscellaneous nonmetallic mineral pr	0.0	0.0	0.0	0.0
203 Iron and steel mills	0.0	0.2	0.0	0.3
204 Ferroalloy and related product manufa	0.0	0.0	0.0	0.0
205 Iron- steel pipe and tube from purchas	0.0	0.0	0.0	0.0
206 Rolled steel shape manufacturing	0.0	0.1	0.0	0.1
207 Steel wire drawing	0.0	0.1	0.0	0.1
208 Alumina refining	0.0	0.0	0.0	0.0
209 Primary aluminum production	0.0	0.0	0.0	0.0
210 Secondary smelting and alloying of a	0.0	0.0	0.0	0.0
211 Aluminum sheet- plate- and foil manuf	0.0	0.0	0.0	0.0
212 Aluminum extruded product manufact	0.0	0.0	0.0	0.0
213 Other aluminum rolling and drawing	0.0	0.0	0.0	0.0
214 Primary smelting and refining of copp	0.0	0.0	0.0	0.0
215 Primary nonferrous metal- except cop	0.0	0.0	0.0	0.0
216 Copper rolling- drawing- and extrudin	0.0	0.0	0.0	0.0
217 Copper wire- except mechanical- draw	0.0	0.0	0.0	0.0
218 Secondary processing of copper	0.0	0.0	0.0	0.0
219 Nonferrous metal- except copper and	0.0	0.0	0.0	0.0
220 Secondary processing of other nonferr	0.0	0.0	0.0	0.0
221 Ferrous metal foundaries	0.0	0.0	0.0	0.0
222 Aluminum foundries	0.0	0.1	0.0	0.2
223 Nonferrous foundries- except alumin	0.0	0.1	0.0	0.1
224 Iron and steel forging	0.0	0.0	0.0	0.0
225 Nonferrous forging	0.0	0.0	0.0	0.0
226 Custom roll forming	0.0	0.0	0.0	0.0
227 All other forging and stamping	0.0	0.1	0.0	0.2
228 Cutlery and flatware- except precious	0.0	0.0	0.0	0.0
229 Hand and edge tool manufacturing	0.4	0.2	0.1	0.7
230 Saw blade and handsaw manufacturin	0.0	0.0	0.0	0.0
231 Kitchen utensil- pot- and pan manufac	0.1	0.0	0.0	0.1
232 Prefabricated metal buildings and co	0.0	0.0	0.0	0.0
233 Fabricated structural metal manufactu	0.0	0.0	0.0	0.0

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
234 Plate work manufacturing	0.0	0.0	0.0	0.0
235 Metal window and door manufacturing	0.0	0.0	0.0	0.0
236 Sheet metal work manufacturing	0.0	0.1	0.0	0.1
237 Ornamental and architectural metal w	0.0	0.0	0.0	0.0
238 Power boiler and heat exchanger manu	0.0	0.0	0.0	0.0
239 Metal tank- heavy gauge- manufacturi	0.0	0.0	0.0	0.0
240 Metal can- box- and other container m	0.0	0.1	0.0	0.1
241 Hardware manufacturing	0.1	0.2	0.0	0.3
242 Spring and wire product manufacturin	0.1	0.6	0.1	0.9
243 Machine shops	0.0	2.8	0.5	3.3
244 Turned product and screw- nut- and b	0.1	0.9	0.2	1.1
245 Metal heat treating	0.0	0.1	0.0	0.2
246 Metal coating and nonprecious engrav	0.0	0.2	0.0	0.2
247 Electroplating- anodizing- and colorin	0.0	0.5	0.1	0.6
248 Metal valve manufacturing	0.0	0.3	0.1	0.4
249 Ball and roller bearing manufacturing	0.0	0.0	0.0	0.1
250 Small arms manufacturing	0.0	0.0	0.0	0.0
251 Other ordnance and accessories manuf	0.0	0.0	0.0	0.0
252 Fabricated pipe and pipe fitting manuf	0.0	0.1	0.0	0.1
253 Industrial pattern manufacturing	0.0	0.0	0.0	0.0
254 Enameled iron and metal sanitary war	0.0	0.0	0.0	0.0
255 Miscellaneous fabricated metal produ	0.0	0.0	0.0	0.0
256 Ammunition manufacturing	0.0	0.0	0.0	0.0
257 Farm machinery and equipment manufa	0.0	0.0	0.0	0.0
258 Lawn and garden equipment manufactu	0.2	0.3	0.1	0.5
259 Construction machinery manufacturin	0.0	0.0	0.0	0.0
260 Mining machinery and equipment manu	0.0	0.0	0.0	0.0
261 Oil and gas field machinery and equi	0.0	0.0	0.0	0.0
262 Sawmill and woodworking machinery	0.1	0.0	0.0	0.1
263 Plastics and rubber industry machiner	0.0	0.0	0.0	0.0
264 Paper industry machinery manufacturi	0.0	0.0	0.0	0.0
265 Textile machinery manufacturing	0.0	0.0	0.0	0.0
266 Printing machinery and equipment man	0.0	0.0	0.0	0.0
267 Food product machinery manufacturin	0.0	0.1	0.0	0.1
268 Semiconductor machinery manufacturi	0.0	0.0	0.0	0.0
269 All other industrial machinery manufa	0.1	0.0	0.0	0.2
270 Office machinery manufacturing	0.0	0.0	0.0	0.0
271 Optical instrument and lens manufactu	0.1	0.0	0.0	0.1
272 Photographic and photocopying equip	0.0	0.0	0.0	0.0
273 Other commercial and service industr	0.0	0.1	0.0	0.1
274 Automatic vending- commercial laund	0.0	0.1	0.0	0.1
275 Air purification equipment manufactur	0.0	0.0	0.0	0.0
276 Industrial and commercial fan and bl	0.0	0.0	0.0	0.0
277 Heating equipment- except warm air f	0.0	0.0	0.0	0.0
278 AC- refrigeration- and forced air heati	0.0	0.0	0.0	0.0
279 Industrial mold manufacturing	0.0	0.0	0.0	0.1
280 Metal cutting machine tool manufactur	0.0	0.0	0.0	0.0
281 Metal forming machine tool manufactu	0.0	0.0	0.0	0.0
282 Special tool- die- jig- and fixture man	0.0	0.1	0.0	0.2
283 Cutting tool and machine tool accesso	0.0	0.2	0.0	0.2
284 Rolling mill and other metalworking m	0.0	0.0	0.0	0.0
285 Turbine and turbine generator set unit	0.0	0.0	0.0	0.0
286 Other engine equipment manufacturin	0.1	0.4	0.1	0.6
287 Speed changers and mechanical power	0.0	0.1	0.0	0.2
288 Pump and pumping equipment manufac	0.0	0.0	0.0	0.0
289 Air and gas compressor manufacturin	0.0	0.1	0.0	0.1
290 Measuring and dispensing pump manuf	0.0	0.0	0.0	0.0
291 Elevator and moving stairway manufac	0.0	0.0	0.0	0.0
292 Conveyor and conveying equipment m	0.0	0.0	0.0	0.0
293 Overhead cranes- hoists- and monorai	0.0	0.0	0.0	0.0
294 Industrial truck- trailer- and stacker m	0.0	0.0	0.0	0.0
295 Power-driven handtool manufacturing	0.1	0.0	0.0	0.2

Appendix C: Example Employment Impacts

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
296 Welding and soldering equipment man	0.0	0.1	0.0	0.1
297 Packaging machinery manufacturing	0.0	0.1	0.0	0.1
298 Industrial process furnace and oven m	0.0	0.0	0.0	0.0
299 Fluid power cylinder and actuator man	0.0	0.0	0.0	0.0
300 Fluid power pump and motor manufact	0.0	0.0	0.0	0.0
301 Scales- balances- and miscellaneous g	0.0	0.0	0.0	0.0
302 Electronic computer manufacturing	0.7	0.1	0.1	0.9
303 Computer storage device manufacturi	0.1	0.1	0.0	0.2
304 Computer terminal manufacturing	0.0	0.0	0.0	0.0
305 Other computer peripheral equipment	0.1	0.0	0.0	0.1
306 Telephone apparatus manufacturing	0.0	0.0	0.0	0.1
307 Broadcast and wireless communicatio	0.2	0.1	0.0	0.3
308 Other communications equipment manu	0.0	0.0	0.0	0.1
309 Audio and video equipment manufactu	0.1	0.0	0.0	0.1
310 Electron tube manufacturing	0.0	0.0	0.0	0.0
311 Semiconductors and related device ma	0.0	0.1	0.0	0.1
312 All other electronic component manufa	0.2	0.9	0.2	1.4
313 Electromedical apparatus manufacturi	0.0	0.1	0.0	0.2
314 Search- detection- and navigation inst	0.0	0.0	0.0	0.0
315 Automatic environmental control manu	0.0	0.1	0.0	0.1
316 Industrial process variable instrument	0.1	0.1	0.0	0.2
317 Totalizing fluid meters and counting d	0.0	0.0	0.0	0.0
318 Electricity and signal testing instrumen	0.0	0.1	0.0	0.1
319 Analytical laboratory instrument manu	0.0	0.0	0.0	0.0
320 Irradiation apparatus manufacturing	0.0	0.1	0.0	0.1
321 Watch- clock- and other measuring and	0.6	0.1	0.1	0.7
322 Software reproducing	0.0	0.2	0.1	0.3
323 Audio and video media reproduction	0.0	0.0	0.0	0.0
324 Magnetic and optical recording media	0.0	0.0	0.0	0.0
325 Electric lamp bulb and part manufactu	0.0	0.0	0.0	0.0
326 Lighting fixture manufacturing	0.0	0.0	0.0	0.0
327 Electric housewares and household fa	0.0	0.0	0.0	0.0
328 Household vacuum cleaner manufactu	0.0	0.0	0.0	0.0
329 Household cooking appliance manufac	0.0	0.0	0.0	0.0
330 Household refrigerator and home free	0.0	0.0	0.0	0.0
331 Household laundry equipment manufac	0.0	0.0	0.0	0.0
332 Other major household appliance manu	0.0	0.0	0.0	0.0
333 Electric power and specialty transfor	0.0	0.0	0.0	0.0
334 Motor and generator manufacturing	0.0	0.2	0.0	0.2
335 Switchgear and switchboard apparatus	0.0	0.1	0.0	0.1
336 Relay and industrial control manufactu	0.0	0.2	0.0	0.2
337 Storage battery manufacturing	0.1	0.1	0.0	0.2
338 Primary battery manufacturing	0.5	0.0	0.1	0.6
339 Fiber optic cable manufacturing	0.0	0.0	0.0	0.0
340 Other communication and energy wire	0.0	0.0	0.0	0.1
341 Wiring device manufacturing	0.0	0.0	0.0	0.0
342 Carbon and graphite product manufact	0.0	0.0	0.0	0.0
343 Miscellaneous electrical equipment m	0.2	0.0	0.0	0.3
344 Automobile and light truck manufactu	7.5	0.1	1.4	8.9
345 Heavy duty truck manufacturing	0.0	0.0	0.0	0.0
346 Motor vehicle body manufacturing	0.0	0.2	0.0	0.2
347 Truck trailer manufacturing	0.0	0.0	0.0	0.0
348 Motor home manufacturing	0.0	0.0	0.0	0.0
349 Travel trailer and camper manufacturi	1.0	0.0	0.2	1.2
350 Motor vehicle parts manufacturing	1.9	14.0	3.0	18.9
351 Aircraft manufacturing	0.0	0.0	0.0	0.0
352 Aircraft engine and engine parts manu	0.0	0.2	0.0	0.2
353 Other aircraft parts and equipment	0.1	0.0	0.0	0.1
354 Guided missile and space vehicle man	0.0	0.0	0.0	0.0
355 Propulsion units and parts for space v	0.0	0.0	0.0	0.0
356 Railroad rolling stock manufacturing	0.0	0.0	0.0	0.0
357 Ship building and repairing	0.0	0.0	0.0	0.0

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
358 Boat building	0.0	0.0	0.0	0.0
359 Motorcycle- bicycle- and parts manufa	0.0	0.0	0.0	0.0
360 Military armored vehicles and tank pa	0.0	0.0	0.0	0.0
361 All other transportation equipment ma	0.0	0.0	0.0	0.0
362 Wood kitchen cabinet and countertop	0.7	2.5	0.6	3.7
363 Upholstered household furniture manu	0.3	0.0	0.0	0.3
364 Nonupholstered wood household furni	1.1	0.0	0.2	1.3
365 Metal household furniture manufactur	0.3	0.0	0.1	0.3
366 Institutional furniture manufacturing	0.0	0.0	0.0	0.0
367 Other household and institutional furni	0.1	0.0	0.0	0.1
368 Wood office furniture manufacturing	0.0	0.0	0.0	0.0
369 Custom architectural woodwork and m	0.0	0.0	0.0	0.0
370 Office furniture- except wood- manufa	0.0	0.0	0.0	0.0
371 Showcases- partitions- shelving- and l	0.0	0.1	0.0	0.1
372 Mattress manufacturing	2.1	0.0	0.4	2.5
373 Blind and shade manufacturing	0.2	0.0	0.0	0.2
374 Laboratory apparatus and furniture ma	0.0	0.0	0.0	0.1
375 Surgical and medical instrument manu	0.1	3.0	0.5	3.7
376 Surgical appliance and supplies manuf	2.8	2.6	0.9	6.4
377 Dental equipment and supplies manufa	0.0	0.1	0.0	0.1
378 Ophthalmic goods manufacturing	2.8	0.0	0.5	3.3
379 Dental laboratories	0.0	4.2	0.7	4.9
380 Jewelry and silverware manufacturing	0.0	0.0	0.0	0.0
381 Sporting and athletic goods manufactu	0.0	0.0	0.0	0.0
382 Doll- toy- and game manufacturing	0.0	0.0	0.0	0.0
383 Office supplies- except paper- manufa	0.0	0.0	0.0	0.0
384 Sign manufacturing	0.0	0.4	0.1	0.5
385 Gasket- packing- and sealing device	0.0	0.0	0.0	0.0
386 Musical instrument manufacturing	0.0	0.0	0.0	0.0
387 Broom- brush- and mop manufacturing	0.1	0.1	0.0	0.2
388 Burial casket manufacturing	0.0	0.0	0.0	0.0
389 Buttons- pins- and all other miscella	0.1	0.0	0.0	0.1
390 Wholesale trade	-99.0	4.2	3.6	-91.2
391 Air transportation	3.7	1.0	0.9	5.6
392 Rail transportation	-8.8	5.9	0.4	-2.5
393 Water transportation	-2.9	0.5	0.4	-2.0
394 Truck transportation	-6.7	12.0	6.7	11.9
395 Transit and ground passenger transpor	5.8	1.4	1.3	8.5
396 Pipeline transportation	-0.8	0.9	0.0	0.1
397 Scenic and sightseeing transportation	-0.3	-0.1	1.3	0.9
398 Postal service	3.6	13.9	3.5	21.1
399 Couriers and messengers	0.0	8.5	2.3	10.8
400 Warehousing and storage	0.4	2.7	1.6	4.8
401 Motor vehicle and parts dealers	139.8	3.8	25.1	168.6
402 Furniture and home furnishings stores	40.5	1.4	7.3	49.2
403 Electronics and appliance stores	39.6	1.2	7.1	48.0
404 Building material and garden supply s	80.2	2.2	14.4	96.7
405 Food and beverage stores	206.8	5.7	37.1	249.6
406 Health and personal care stores	90.2	2.6	16.2	109.0
407 Gasoline stations	-1,567.4	1.6	8.8	-1,557.0
408 Clothing and clothing accessories stor	100.6	2.8	18.1	121.5
409 Sporting goods- hobby- book and musi	56.6	1.5	10.1	68.3
410 General merchandise stores	178.2	4.8	31.9	215.0
411 Miscellaneous store retailers	69.1	2.0	12.4	83.4
412 Nonstore retailers	81.4	2.2	14.6	98.2
413 Newspaper publishers	1.2	3.7	1.4	6.2
414 Periodical publishers	1.0	1.1	0.5	2.6
415 Book publishers	1.0	0.2	0.2	1.4
416 Database- directory- and other publish	0.3	1.2	0.4	2.0
417 Software publishers	0.2	0.0	0.0	0.3
418 Motion picture and video industries	5.7	4.0	1.8	11.6
419 Sound recording industries	0.7	0.1	0.1	0.9

Appendix C: Example Employment Impacts

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
420 Radio and television broadcasting	1.0	2.3	0.9	4.1
421 Cable networks and program distribut	0.7	0.0	0.1	0.9
422 Telecommunications	26.6	8.7	6.2	41.5
423 Information services	0.4	0.3	0.1	0.8
424 Data processing services	0.0	1.4	0.3	1.7
425 Nondepository credit intermediation an	17.5	19.3	7.5	44.3
426 Securities- commodity contracts- inve	27.7	29.8	10.1	67.7
427 Insurance carriers	48.0	15.5	11.9	75.3
428 Insurance agencies- brokerages- and r	0.0	22.2	4.2	26.4
429 Funds- trusts- and other financial vehi	11.7	0.2	2.4	14.3
430 Monetary authorities and depository c	40.1	9.7	8.6	58.4
431 Real estate	101.8	90.4	33.8	226.1
432 Automotive equipment rental and leas	12.5	3.0	2.9	18.5
433 Video tape and disc rental	11.4	0.0	2.1	13.5
434 Machinery and equipment rental and l	0.1	1.3	0.3	1.7
435 General and consumer goods rental ex	8.4	1.9	2.0	12.3
436 Lessors of nonfinancial intangible asse	0.0	0.4	0.1	0.4
437 Legal services	42.2	32.8	12.4	87.4
438 Accounting and bookkeeping services	5.4	20.0	5.2	30.6
439 Architectural and engineering services	0.1	14.2	2.7	16.9
440 Specialized design services	1.0	2.2	0.7	3.9
441 Custom computer programming servic	0.0	2.3	0.5	2.8
442 Computer systems design services	0.3	3.8	0.9	4.9
443 Other computer related services- includ	0.1	2.7	0.5	3.3
444 Management consulting services	0.7	14.1	3.1	17.9
445 Environmental and other technical cons	0.0	1.2	0.4	1.7
446 Scientific research and development s	1.7	3.6	1.1	6.3
447 Advertising and related services	0.2	8.8	2.9	11.8
448 Photographic services	6.2	1.1	1.4	8.6
449 Veterinary services	19.7	0.7	3.8	24.2
450 All other miscellaneous professional a	0.0	3.8	0.6	4.4
451 Management of companies and enterpr	0.0	10.4	5.0	15.5
452 Office administrative services	0.0	5.7	1.2	6.9
453 Facilities support services	0.0	0.4	0.1	0.4
454 Employment services	1.5	77.6	15.7	94.8
455 Business support services	1.5	11.8	2.7	16.0
456 Travel arrangement and reservation se	4.0	1.5	1.2	6.6
457 Investigation and security services	2.7	13.5	3.3	19.4
458 Services to buildings and dwellings	6.7	42.8	9.4	59.0
459 Other support services	0.2	5.2	1.3	6.7
460 Waste management and remediation se	2.5	4.0	1.1	7.7
461 Elementary and secondary schools	62.4	0.0	12.9	75.3
462 Colleges- universities- and junior coll	89.0	3.0	16.8	108.8
463 Other educational services	43.5	2.5	8.7	54.7
464 Home health care services	88.1	0.0	15.0	103.1
465 Offices of physicians- dentists- and ot	290.1	0.0	50.2	340.3
466 Other ambulatory health care services	61.6	4.0	11.2	76.7
467 Hospitals	349.6	0.0	59.1	408.7
468 Nursing and residential care facilities	207.1	0.0	35.4	242.6
469 Child day care services	94.1	0.0	17.5	111.6
470 Social assistance- except child day ca	134.1	0.0	24.4	158.5
471 Performing arts companies	18.2	6.2	4.4	28.9
472 Spectator sports	9.4	2.6	2.2	14.2
473 Independent artists- writers- and perf	0.0	2.0	0.4	2.4
474 Promoters of performing arts and spor	6.0	2.4	1.6	10.1
475 Museums- historical sites- zoos- and	7.5	0.0	1.4	8.8
476 Fitness and recreational sports centers	34.5	1.7	6.5	42.8
477 Bowling centers	4.9	0.1	1.0	5.9
478 Other amusement- gambling- and recrea	82.3	0.9	15.2	98.4
479 Hotels and motels- including casino ho	25.0	4.8	5.7	35.5
480 Other accommodations	5.2	0.1	1.0	6.2
481 Food services and drinking places	644.4	51.3	124.3	820.0

Appendix C: Example Employment Impacts

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
482 Car washes	14.2	0.9	2.8	17.9
483 Automotive repair and maintenance- e	108.5	9.3	21.7	139.4
484 Electronic equipment repair and main	0.3	3.4	0.9	4.5
485 Commercial machinery repair and mai	0.0	3.7	0.9	4.6
486 Household goods repair and maintena	5.5	1.7	1.4	8.5
487 Personal care services	64.0	1.1	11.3	76.4
488 Death care services	16.0	0.0	2.3	18.3
489 Drycleaning and laundry services	21.9	7.6	5.5	35.0
490 Other personal services	25.7	0.8	4.9	31.4
491 Religious organizations	27.6	0.0	5.0	32.7
492 Grantmaking and giving and social ad	18.3	0.0	3.3	21.6
493 Civic- social- professional and similar	34.3	14.6	9.0	57.9
494 Private households	125.3	0.0	23.4	148.8
495 Federal electric utilities	0.0	0.0	0.0	0.0
496 Other Federal Government enterprises	0.1	0.2	0.1	0.3
497 State and local government passenger t	10.4	2.4	2.3	15.1
498 State and local government electric uti	37.0	0.5	0.4	37.9
499 Other State and local government ente	32.6	9.9	7.1	49.7
500 Noncomparable imports	0.0	0.0	0.0	0.0
501 Scrap	0.0	0.0	0.0	0.0
502 Used and secondhand goods	0.0	0.0	0.0	0.0
503 State & Local Education	0.0	0.0	0.0	0.0
504 State & Local Non-Education	0.0	0.0	0.0	0.0
505 Federal Military	0.0	0.0	0.0	0.0
506 Federal Non-Military	0.0	0.0	0.0	0.0
507 Rest of the world adjustment to final	0.0	0.0	0.0	0.0
508 Inventory valuation adjustment	0.0	0.0	0.0	0.0
509 Owner-occupied dwellings	0.0	0.0	0.0	0.0
11,001 Federal Government NonDefense	0.0	0.0	0.0	0.0
12,001 State/Local Govt NonEducation	0.0	0.0	0.0	0.0
12,003 State/Local Govt Investment	0.0	0.0	0.0	0.0
14,001 Capital	0.0	0.0	0.0	0.0
14,002 Inventory Additions/Deletions	0.0	0.0	0.0	0.0
	2,857.4	891.8	960.3	4,709.5

D

APPENDIX D: PETROLEUM DEMAND BY HOUSEHOLD INCOME

Appendix D: Petroleum Demand by Household Income

Cleveland, Ohio MSA

Commodity	Household Income Bracket								
	(<u><\$10k</u>)	(<u>\$10-15k</u>)	(<u>\$15-25k</u>)	(<u>\$25-35k</u>)	(<u>\$35-50k</u>)	(<u>\$50-75k</u>)	(<u>\$75-100k</u>)	(<u>\$100-150k</u>)	(<u>\$150+</u>)
142 Petroleum refineries	83.035	68.346	140.241	161.682	279.127	388.801	217.490	178.472	118.830

*Millions of Dollars

Note: Demands are commodity based and include imports

E

APPENDIX E: INDUSTRY-SPECIFIC ECONOMIC IMPACTS



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
1 Oilseed farming	1,811	-270	1,248	2,790	1.00
2 Grain farming	4,485	3,776	2,891	11,152	1.00
3 Vegetable and melon farming	97,252	3,087	31,507	131,845	1.00
4 Tree nut farming	24	4	8	36	1.00
5 Fruit farming	32,810	2,093	10,580	45,483	1.00
6 Greenhouse and nursery production	393,888	86,280	197,874	678,043	1.00
7 Tobacco farming	0	0	0	0	1.00
8 Cotton farming	0	0	0	0	1.00
9 Sugarcane and sugar beet farming	0	0	0	0	1.00
10 All other crop farming	4,024	21,708	14,972	40,704	1.00
11 Cattle ranching and farming	10,927	416,536	146,999	574,463	1.00
12 Poultry and egg production	15,819	6,758	7,281	29,858	1.00
13 Animal production- except cattle and	65,412	34,362	32,626	132,401	1.00
14 Logging	0	4,725	17,562	22,287	1.00
15 Forest nurseries- forest products- and	0	0	0	0	1.00
16 Fishing	0	0	0	0	1.00
17 Hunting and trapping	23,522	251	7,574	31,347	1.00
18 Agriculture and forestry support activi	1,850	2,676	1,734	6,261	1.00
19 Oil and gas extraction	-7,783,938	16,378,670	1,453,740	10,048,472	1.00
20 Coal mining	11	15,336	374	15,721	1.00
21 Iron ore mining	0	0	0	0	1.00
22 Copper- nickel- lead- and zinc mining	0	0	0	0	1.00
23 Gold- silver- and other metal ore mini	0	0	0	0	1.00
24 Stone mining and quarrying	0	192	697	889	1.00
25 Sand- gravel- clay- and refractory min	0	708	2,328	3,036	1.00
26 Other nonmetallic mineral mining	71	5,351	11,549	16,971	1.00
27 Drilling oil and gas wells	0	3,281	115,716	118,997	1.00
28 Support activities for oil and gas oper	0	41,376	41,127	82,503	1.00
29 Support activities for other mining	0	2	3,341	3,343	1.00
30 Power generation and supply	176,170,576	724,048	4,090,167	180,984,784	1.00
31 Natural gas distribution	2,339,279	75,209	1,035,073	3,449,560	1.00
32 Water- sewage and other systems	266,335	99,329	118,899	484,563	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Cleveland EV 2008 090908.iap

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
33 New residential 1-unit structures- all	0	0	11,897,863	11,897,863	1.00
34 New multifamily housing structures- a	0	0	1,408,797	1,408,797	1.00
35 New residential additions and alteratio	0	0	3,198,221	3,198,221	1.00
36 New farm housing units	0	0	0	0	1.00
37 Manufacturing and industrial building	0	0	1,308,721	1,308,721	1.00
38 Commercial and institutional building	0	0	7,994,964	7,994,964	1.00
39 Highway- street- bridge- and tunnel co	0	0	1,573,827	1,573,827	1.00
40 Water- sewer- and pipeline constructi	0	0	968,969	968,969	1.00
41 Other new construction	0	0	2,183,631	2,183,631	1.00
42 Maintenance and repair of farm and n	0	557,239	773,965	1,331,204	1.00
43 Maintenance and repair of nonresidenti	0	1,327,017	1,142,264	2,469,281	1.00
44 Maintenance and repair of highways- st	0	0	565,627	565,627	1.00
45 Other maintenance and repair construc	0	2,405,361	240,048	2,645,409	1.00
46 Dog and cat food manufacturing	15,645	7,987	7,229	30,861	1.00
47 Other animal food manufacturing	1,986	1,375	1,132	4,493	1.00
48 Flour milling	33,973	12,122	14,478	60,572	1.00
49 Rice milling	0	0	0	0	1.00
50 Malt manufacturing	0	0	0	0	1.00
51 Wet corn milling	0	0	0	0	1.00
52 Soybean processing	0	0	0	0	1.00
53 Other oilseed processing	0	0	0	0	1.00
54 Fats and oils refining and blending	15,513	7,700	7,601	30,814	1.00
55 Breakfast cereal manufacturing	0	0	0	0	1.00
56 Sugar manufacturing	12,092	5,116	5,674	22,882	1.00
57 Confectionery manufacturing from ca	0	0	0	0	1.00
58 Confectionery manufacturing from pu	31,710	2,253	10,674	44,637	1.00
59 Nonchocolate confectionery manufact	14,342	1,604	5,467	21,413	1.00
60 Frozen food manufacturing	81,528	20,236	31,980	133,743	1.00
61 Fruit and vegetable canning and dryin	35,201	8,523	14,293	58,018	1.00
62 Fluid milk manufacturing	1,176,850	382,322	568,601	2,127,773	1.00
63 Creamery butter manufacturing	0	0	0	0	1.00
64 Cheese manufacturing	719,603	482,361	376,971	1,578,935	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Cleveland EV 2008 090908.iap

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

Industry	Direct*	Indirect*	Induced*	Total*	Deflator
65 Dry- condensed- and evaporated dairy	0	0	0	0	1.00
66 Ice cream and frozen dessert manufact	26,914	49,292	27,974	104,181	1.00
67 Animal- except poultry- slaughtering	16,365	3,395	6,750	26,511	1.00
68 Meat processed from carcasses	153,743	54,306	64,610	272,659	1.00
69 Rendering and meat byproduct proces	72	2,407	976	3,456	1.00
70 Poultry processing	172,377	37,341	63,434	273,153	1.00
71 Seafood product preparation and pack	0	0	0	0	1.00
72 Frozen cakes and other pastries manuf	99,588	25,041	37,866	162,496	1.00
73 Bread and bakery product- except fro	1,427,652	420,352	620,011	2,468,015	1.00
74 Cookie and cracker manufacturing	179,103	18,934	60,491	258,528	1.00
75 Mixes and dough made from purchased	447,198	58,321	155,600	661,119	1.00
76 Dry pasta manufacturing	0	0	0	0	1.00
77 Tortilla manufacturing	6,334	2,894	2,851	12,080	1.00
78 Roasted nuts and peanut butter manufa	49,474	3,864	17,123	70,461	1.00
79 Other snack food manufacturing	382,474	137,207	156,889	676,570	1.00
80 Coffee and tea manufacturing	8,169	170	2,706	11,045	1.00
81 Flavoring syrup and concentrate manu	4,031	38,528	15,065	57,624	1.00
82 Mayonnaise- dressing- and sauce manu	140,715	56,884	64,916	262,516	1.00
83 Spice and extract manufacturing	293,713	109,304	130,417	533,434	1.00
84 All other food manufacturing	397,330	42,883	131,878	572,092	1.00
85 Soft drink and ice manufacturing	206,766	46,310	76,267	329,344	1.00
86 Breweries	4,833	765	1,675	7,272	1.00
87 Wineries	13,095	3,204	4,917	21,215	1.00
88 Distilleries	14,597	5,284	6,060	25,941	1.00
89 Tobacco stemming and redrying	0	0	0	0	1.00
90 Cigarette manufacturing	0	0	0	0	1.00
91 Other tobacco product manufacturing	0	0	0	0	1.00
92 Fiber- yarn- and thread mills	14	28	15	57	1.00
93 Broadwoven fabric mills	886	211	394	1,490	1.00
94 Narrow fabric mills and schiffli embro	321	730	431	1,483	1.00
95 Nonwoven fabric mills	134	159	151	444	1.00
96 Knit fabric mills	0	0	0	0	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Cleveland EV 2008 090908.iap

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
97 Textile and fabric finishing mills	1,436	7,085	4,191	12,712	1.00
98 Fabric coating mills	620	1,309	3,566	5,496	1.00
99 Carpet and rug mills	0	0	0	0	1.00
100 Curtain and linen mills	126,398	8,445	45,232	180,075	1.00
101 Textile bag and canvas mills	8,888	532	3,584	13,005	1.00
102 Tire cord and tire fabric mills	3	6	5	14	1.00
103 Other miscellaneous textile product mi	3,906	579	1,724	6,209	1.00
104 Sheer hosiery mills	0	0	0	0	1.00
105 Other hosiery and sock mills	0	0	0	0	1.00
106 Other apparel knitting mills	0	0	0	0	1.00
107 Cut and sew apparel manufacturing	1,041,275	16,054	346,109	1,403,438	1.00
108 Accessories and other apparel manufa	2,838	79	999	3,915	1.00
109 Leather and hide tanning and finishing	177	288	251	716	1.00
110 Footwear manufacturing	59,047	110	18,013	77,170	1.00
111 Other leather product manufacturing	20,930	1,156	7,432	29,518	1.00
112 Sawmills	0	15,610	37,232	52,843	1.00
113 Wood preservation	0	2,867	7,467	10,334	1.00
114 Reconstituted wood product manufact	0	0	0	0	1.00
115 Veneer and plywood manufacturing	0	0	0	0	1.00
116 Engineered wood member and truss ma	0	27,497	65,986	93,483	1.00
117 Wood windows and door manufacturi	320	57,150	127,135	184,605	1.00
118 Cut stock- resawing lumber- and plani	0	0	0	0	1.00
119 Other millwork- including flooring	0	94,429	220,924	315,353	1.00
120 Wood container and pallet manufactur	31,876	-86,593	48,653	-6,064	1.00
121 Manufactured home- mobile home- ma	0	0	0	0	1.00
122 Prefabricated wood building manufact	0	15	37	52	1.00
123 Miscellaneous wood product manufact	18,727	5,978	15,896	40,601	1.00
124 Pulp mills	0	0	0	0	1.00
125 Paper and paperboard mills	21	16	19	56	1.00
126 Paperboard container manufacturing	3,768	15,077	11,611	30,456	1.00
127 Flexible packaging foil manufacturing	222	3,726	1,917	5,865	1.00
128 Surface-coated paperboard manufactu	15	957	2,153	3,124	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

Industry	Direct*	Indirect*	Induced*	Total*	Deflator
129 Coated and laminated paper and packa	57,163	74,974	88,553	220,690	1.00
130 Coated and uncoated paper bag manuf	146	146	232	524	1.00
131 Die-cut paper office supplies manufac	281	73	261	615	1.00
132 Envelope manufacturing	69	119	164	353	1.00
133 Stationery and related product manufa	608	125	482	1,215	1.00
134 Sanitary paper product manufacturing	3,508	1,189	1,513	6,210	1.00
135 All other converted paper product man	658	1,005	1,897	3,560	1.00
136 Manifold business forms printing	6,394	19,847	48,211	74,451	1.00
137 Books printing	5	762	404	1,171	1.00
138 Blankbook and looseleaf binder manuf	41,458	8,528	33,365	83,351	1.00
139 Commercial printing	58,108	78,845	277,903	414,856	1.00
140 Tradebinding and related work	1,239	5,328	10,400	16,968	1.00
141 Prepress services	718	8,792	11,247	20,756	1.00
142 Petroleum refineries	0	0	0	0	1.00
143 Asphalt paving mixture and block man	0	78,804	240,761	319,565	1.00
144 Asphalt shingle and coating materials	0	138,138	199,337	337,475	1.00
145 Petroleum lubricating oil and grease	-3,694	24,453	166,859	187,619	1.00
146 All other petroleum and coal products	-47,077	-2,194	3,646	-45,625	1.00
147 Petrochemical manufacturing	-31,051,922	-7,817,106	1,360,334	-37,508,692	1.00
148 Industrial gas manufacturing	22,749	150,812	123,531	297,092	1.00
149 Synthetic dye and pigment manufactur	352	37,942	70,035	108,328	1.00
150 Other basic inorganic chemical manufa	590	38,571	84,177	123,338	1.00
151 Other basic organic chemical manufac	18,213	-136,404	213,766	95,574	1.00
152 Plastics material and resin manufactur	7,372	-216,138	50,746	-158,020	1.00
153 Synthetic rubber manufacturing	2,470	-2,553	20,339	20,256	1.00
154 Cellulosic organic fiber manufacturing	0	-9	9	0	1.00
155 Noncellulosic organic fiber manufactu	51	25	142	218	1.00
156 Nitrogenous fertilizer manufacturing	2,267	-8,754	32,176	25,689	1.00
157 Phosphatic fertilizer manufacturing	0	0	0	0	1.00
158 Fertilizer- mixing only- manufacturing	5	30	50	86	1.00
159 Pesticide and other agricultural chemi	1,305	1,334	1,294	3,933	1.00
160 Pharmaceutical and medicine manufac	6,092,373	1,925,935	2,549,429	10,567,736	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Cleveland EV 2008 090908.iap

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
161 Paint and coating manufacturing	919	3,779	9,622	14,320	1.00
162 Adhesive manufacturing	60,955	95,673	128,552	285,180	1.00
163 Soap and other detergent manufacturin	1,116,264	149,530	469,549	1,735,343	1.00
164 Polish and other sanitation good manu	825,275	135,842	370,172	1,331,289	1.00
165 Surface active agent manufacturing	0	0	0	0	1.00
166 Toilet preparation manufacturing	1,598,114	206,355	567,014	2,371,483	1.00
167 Printing ink manufacturing	1	17,408	26,409	43,817	1.00
168 Explosives manufacturing	0	0	0	0	1.00
169 Custom compounding of purchased res	70	65,252	84,172	149,494	1.00
170 Photographic film and chemical manuf	53,600	100,227	184,207	338,034	1.00
171 Other miscellaneous chemical product	40,975	186,324	163,131	390,430	1.00
172 Plastics packagene materials- film and	183,414	172,697	275,654	631,765	1.00
173 Plastics pipe- fittings- and profile sha	10,667	347,938	291,513	650,118	1.00
174 Laminated plastics plate- sheet- and s	3,790	47,747	46,545	98,081	1.00
175 Plastics bottle manufacturing	843	229,426	86,598	316,867	1.00
176 Resilient floor covering manufacturing	1,953	12,095	24,648	38,697	1.00
177 Plastics plumbing fixtures and all othe	416,111	801,838	942,023	2,159,972	1.00
178 Foam product manufacturing	86,525	441,061	284,146	811,733	1.00
179 Tire manufacturing	178	24	300	502	1.00
180 Rubber and plastics hose and belting	1,951	4,648	6,382	12,981	1.00
181 Other rubber product manufacturing	9,530	12,325	17,921	39,776	1.00
182 Vitreous china plumbing fixture manuf	0	0	0	0	1.00
183 Vitreous china and earthenware articl	27,399	24	9,829	37,252	1.00
184 Porcelain electrical supply manufactur	0	0	0	0	1.00
185 Brick and structural clay tile manufac	0	0	0	0	1.00
186 Ceramic wall and floor tile manufactu	0	130	363	493	1.00
187 Nonclay refractory manufacturing	0	28	62	90	1.00
188 Clay refractory and other structural c	0	1	13	13	1.00
189 Glass container manufacturing	0	0	0	0	1.00
190 Glass and glass products- except glass	92,837	175,046	154,201	422,084	1.00
191 Cement manufacturing	0	0	0	0	1.00
192 Ready-mix concrete manufacturing	0	200	639	839	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Cleveland EV 2008 090908.iap

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
193 Concrete block and brick manufacturi	0	98	483	581	1.00
194 Concrete pipe manufacturing	0	17	35	52	1.00
195 Other concrete product manufacturing	693	152	1,801	2,646	1.00
196 Lime manufacturing	0	9	24	33	1.00
197 Gypsum product manufacturing	1	97	208	307	1.00
198 Abrasive product manufacturing	886	653	942	2,481	1.00
199 Cut stone and stone product manufact	23,591	1,440	57,507	82,539	1.00
200 Ground or treated minerals and earths	0	0	0	1	1.00
201 Mineral wool manufacturing	582	3,050	2,218	5,849	1.00
202 Miscellaneous nonmetallic mineral pr	6,430	237	2,919	9,587	1.00
203 Iron and steel mills	1,661	30,702	81,669	114,033	1.00
204 Ferroalloy and related product manufa	0	0	0	0	1.00
205 Iron- steel pipe and tube from purchas	103	4,250	11,223	15,576	1.00
206 Rolled steel shape manufacturing	454	10,097	26,750	37,301	1.00
207 Steel wire drawing	3,744	4,143	13,896	21,784	1.00
208 Alumina refining	0	0	0	0	1.00
209 Primary aluminum production	0	4	11	14	1.00
210 Secondary smelting and alloying of a	0	91	297	388	1.00
211 Aluminum sheet- plate- and foil manuf	6	1,162	1,890	3,058	1.00
212 Aluminum extruded product manufact	0	9	16	26	1.00
213 Other aluminum rolling and drawing	16	890	1,058	1,964	1.00
214 Primary smelting and refining of copp	0	0	0	0	1.00
215 Primary nonferrous metal- except cop	0	0	0	0	1.00
216 Copper rolling- drawing- and extrudin	21	1,000	2,369	3,389	1.00
217 Copper wire- except mechanical- draw	3,893	45,468	78,226	127,587	1.00
218 Secondary processing of copper	0	285	789	1,075	1.00
219 Nonferrous metal- except copper and	1,025	15,206	11,911	28,143	1.00
220 Secondary processing of other nonferr	24	21,931	18,397	40,352	1.00
221 Ferrous metal foundaries	1	95	365	461	1.00
222 Aluminum foundries	51	2,765	8,118	10,935	1.00
223 Nonferrous foundries- except alumin	19	1,014	2,998	4,030	1.00
224 Iron and steel forging	16	3,552	28,007	31,575	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Cleveland EV 2008 090908.iap

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
225 Nonferrous forging	0	1,096	6,016	7,113	1.00
226 Custom roll forming	5	1,389	3,356	4,749	1.00
227 All other forging and stamping	4,245	12,064	41,341	57,651	1.00
228 Cutlery and flatware- except precious	1,808	158	771	2,736	1.00
229 Hand and edge tool manufacturing	57,048	14,513	57,256	128,817	1.00
230 Saw blade and handsaw manufacturin	5,943	2,561	25,072	33,575	1.00
231 Kitchen utensil- pot- and pan manufac	175,303	21,498	64,266	261,067	1.00
232 Prefabricated metal buildings and co	157	858	3,141	4,156	1.00
233 Fabricated structural metal manufactu	0	1,515	5,160	6,674	1.00
234 Plate work manufacturing	0	6,024	8,392	14,415	1.00
235 Metal window and door manufacturing	479	1,874	3,671	6,024	1.00
236 Sheet metal work manufacturing	49	2,015	5,732	7,795	1.00
237 Ornamental and architectural metal w	10	2,848	5,692	8,550	1.00
238 Power boiler and heat exchanger manu	0	1,101	43,375	44,476	1.00
239 Metal tank- heavy gauge- manufacturi	0	-523	1,600	1,078	1.00
240 Metal can- box- and other container m	3,605	12,311	21,684	37,600	1.00
241 Hardware manufacturing	882	1,497	3,636	6,014	1.00
242 Spring and wire product manufacturin	4,848	25,375	39,855	70,078	1.00
243 Machine shops	211	150,809	173,566	324,587	1.00
244 Turned product and screw- nut- and b	8,077	51,826	104,917	164,820	1.00
245 Metal heat treating	0	14,410	15,757	30,167	1.00
246 Metal coating and nonprecious engrav	104	21,906	21,778	43,788	1.00
247 Electroplating- anodizing- and colorin	0	48,717	57,391	106,108	1.00
248 Metal valve manufacturing	0	6,306	144,429	150,735	1.00
249 Ball and roller bearing manufacturing	0	7,896	17,115	25,011	1.00
250 Small arms manufacturing	0	0	0	0	1.00
251 Other ordnance and accessories manuf	0	0	0	0	1.00
252 Fabricated pipe and pipe fitting manuf	0	9,573	38,581	48,154	1.00
253 Industrial pattern manufacturing	0	315	6,888	7,204	1.00
254 Enameled iron and metal sanitary war	0	0	0	0	1.00
255 Miscellaneous fabricated metal produ	34	612	1,088	1,734	1.00
256 Ammunition manufacturing	30	1	15	46	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Cleveland EV 2008 090908.iap

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
257 Farm machinery and equipment manufa	0	13,471	54,718	68,189	1.00
258 Lawn and garden equipment manufactu	89,079	35,639	727,632	852,350	1.00
259 Construction machinery manufacturin	640	5,454	67,214	73,308	1.00
260 Mining machinery and equipment manu	0	594	63,022	63,616	1.00
261 Oil and gas field machinery and equi	0	306	3,946	4,252	1.00
262 Sawmill and woodworking machinery	12,002	1,351	18,643	31,996	1.00
263 Plastics and rubber industry machiner	242	3,996	100,178	104,415	1.00
264 Paper industry machinery manufacturi	0	300	16,713	17,013	1.00
265 Textile machinery manufacturing	0	98	13,641	13,740	1.00
266 Printing machinery and equipment man	2	-156	39,166	39,012	1.00
267 Food product machinery manufacturin	24	3,196	42,784	46,004	1.00
268 Semiconductor machinery manufacturi	0	0	0	0	1.00
269 All other industrial machinery manufa	13,089	-6,489	355,326	361,925	1.00
270 Office machinery manufacturing	0	0	0	0	1.00
271 Optical instrument and lens manufactu	8,535	2,382	12,301	23,218	1.00
272 Photographic and photocopying equip	5,524	325	3,062	8,911	1.00
273 Other commercial and service industr	12	7,049	385,886	392,947	1.00
274 Automatic vending- commercial laund	25	4,658	4,310	8,993	1.00
275 Air purification equipment manufactur	13	34	386	433	1.00
276 Industrial and commercial fan and bl	9	57	170	236	1.00
277 Heating equipment- except warm air f	0	0	1	1	1.00
278 AC- refrigeration- and forced air heati	0	0	0	0	1.00
279 Industrial mold manufacturing	773	2,350	22,440	25,564	1.00
280 Metal cutting machine tool manufactur	839	513	129,642	130,994	1.00
281 Metal forming machine tool manufactu	13	74	2,558	2,645	1.00
282 Special tool- die- jig- and fixture man	264	7,732	661,380	669,377	1.00
283 Cutting tool and machine tool accesso	11	7,119	26,565	33,695	1.00
284 Rolling mill and other metalworking m	28	631	230,802	231,461	1.00
285 Turbine and turbine generator set unit	0	0	0	0	1.00
286 Other engine equipment manufacturin	18,904	50,797	84,530	154,232	1.00
287 Speed changers and mechanical power	677	23,011	102,316	126,005	1.00
288 Pump and pumping equipment manufac	0	402	1,740	2,142	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Cleveland EV 2008 090908.iap

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
289 Air and gas compressor manufacturin	0	8,078	4,345	12,423	1.00
290 Measuring and dispensing pump manuf	0	2	10	12	1.00
291 Elevator and moving stairway manufac	0	1,339	18,889	20,228	1.00
292 Conveyor and conveying equipment m	42	6,865	273,313	280,220	1.00
293 Overhead cranes- hoists- and monorai	0	2,525	110,306	112,830	1.00
294 Industrial truck- trailer- and stacker m	185	-1,826	269,939	268,298	1.00
295 Power-driven handtool manufacturing	55,916	3,867	145,070	204,854	1.00
296 Welding and soldering equipment man	8,202	24,987	2,316,938	2,350,127	1.00
297 Packaging machinery manufacturing	0	3,617	190,921	194,538	1.00
298 Industrial process furnace and oven m	135	361	1,255	1,751	1.00
299 Fluid power cylinder and actuator man	1	56	1,092	1,150	1.00
300 Fluid power pump and motor manufact	35	72	2,165	2,272	1.00
301 Scales- balances- and miscellaneous g	5,021	12,281	149,119	166,421	1.00
302 Electronic computer manufacturing	1,109,312	78,084	556,783	1,744,180	1.00
303 Computer storage device manufacturi	39,782	75,237	79,725	194,745	1.00
304 Computer terminal manufacturing	2,897	22,060	28,010	52,966	1.00
305 Other computer peripheral equipment	45,606	6,745	31,732	84,083	1.00
306 Telephone apparatus manufacturing	53,960	16,918	992,671	1,063,550	1.00
307 Broadcast and wireless communicatio	45,077	16,769	268,003	329,848	1.00
308 Other communications equipment manu	171	8,421	64,286	72,879	1.00
309 Audio and video equipment manufactu	29,644	664	9,686	39,994	1.00
310 Electron tube manufacturing	135	3,755	7,286	11,176	1.00
311 Semiconductors and related device ma	38	6,709	23,304	30,051	1.00
312 All other electronic component manufa	58,775	94,426	245,470	398,671	1.00
313 Electromedical apparatus manufacturi	50,241	283,743	463,279	797,262	1.00
314 Search- detection- and navigation inst	50	20	612	683	1.00
315 Automatic environmental control manu	0	4,843	13,441	18,285	1.00
316 Industrial process variable instrument	1,217	-6,334	209,134	204,016	1.00
317 Totalizing fluid meters and counting d	0	1,774	1,984	3,758	1.00
318 Electricity and signal testing instrumen	1,889	8,610	129,691	140,190	1.00
319 Analytical laboratory instrument manu	652	711	1,039	2,401	1.00
320 Irradiation apparatus manufacturing	688	24,406	214,782	239,876	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Cleveland EV 2008 090908.iap

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
321 Watch- clock- and other measuring and	28,956	2,259	31,619	62,834	1.00
322 Software reproducing	0	17,285	37,134	54,418	1.00
323 Audio and video media reproduction	16	1,483	1,544	3,043	1.00
324 Magnetic and optical recording media	548	657	688	1,892	1.00
325 Electric lamp bulb and part manufactu	43	21	37	101	1.00
326 Lighting fixture manufacturing	137	64	222	423	1.00
327 Electric housewares and household fa	7,544	258	2,658	10,459	1.00
328 Household vacuum cleaner manufactu	248,535	2,188	164,702	415,425	1.00
329 Household cooking appliance manufac	0	0	0	0	1.00
330 Household refrigerator and home free	0	0	0	0	1.00
331 Household laundry equipment manufac	40	0	13	52	1.00
332 Other major household appliance manu	0	0	0	0	1.00
333 Electric power and specialty transfor	145	-3,328	4,335	1,152	1.00
334 Motor and generator manufacturing	1,906	10,063	28,186	40,155	1.00
335 Switchgear and switchboard apparatus	3,371	46,457	122,617	172,445	1.00
336 Relay and industrial control manufactu	475	21,887	85,602	107,965	1.00
337 Storage battery manufacturing	11,255	3,853	6,865	21,973	1.00
338 Primary battery manufacturing	934	16	296	1,247	1.00
339 Fiber optic cable manufacturing	465	8,335	8,611	17,412	1.00
340 Other communication and energy wire	170	42,600	58,855	101,625	1.00
341 Wiring device manufacturing	340	2,607	5,579	8,526	1.00
342 Carbon and graphite product manufact	1,070	58	7,249	8,376	1.00
343 Miscellaneous electrical equipment m	20,410	5,721	79,505	105,635	1.00
344 Automobile and light truck manufactu	5,577,735	5,951	4,231,019	9,814,704	1.00
345 Heavy duty truck manufacturing	0	0	0	0	1.00
346 Motor vehicle body manufacturing	3,410	15,988	27,322	46,720	1.00
347 Truck trailer manufacturing	10	1,425	180,338	181,772	1.00
348 Motor home manufacturing	0	0	0	0	1.00
349 Travel trailer and camper manufacturi	54,548	993	21,122	76,662	1.00
350 Motor vehicle parts manufacturing	418,458	725,314	794,540	1,938,312	1.00
351 Aircraft manufacturing	6,733	1,692	11,516	19,941	1.00
352 Aircraft engine and engine parts manu	591	91,509	220,405	312,505	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Cleveland EV 2008 090908.iap

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
353 Other aircraft parts and equipment	2,707	2,074	69,368	74,148	1.00
354 Guided missile and space vehicle man	0	0	0	0	1.00
355 Propulsion units and parts for space v	0	0	0	0	1.00
356 Railroad rolling stock manufacturing	85	-312	839	612	1.00
357 Ship building and repairing	0	-162	89	-73	1.00
358 Boat building	6,115	-13	2,344	8,446	1.00
359 Motorcycle- bicycle- and parts manufa	61,836	7,523	24,925	94,284	1.00
360 Military armored vehicles and tank pa	3,198	4	2,649	5,850	1.00
361 All other transportation equipment ma	2,285	223	1,073	3,581	1.00
362 Wood kitchen cabinet and countertop	82,825	233,966	617,450	934,242	1.00
363 Upholstered household furniture manu	40,707	28	13,556	54,291	1.00
364 Nonupholstered wood household furni	316,677	2,808	113,499	432,985	1.00
365 Metal household furniture manufactur	19,625	89	7,235	26,950	1.00
366 Institutional furniture manufacturing	3,023	711	11,106	14,840	1.00
367 Other household and institutional furni	5,087	591	2,443	8,120	1.00
368 Wood office furniture manufacturing	4,416	61	50,401	54,878	1.00
369 Custom architectural woodwork and m	0	3,748	81,658	85,406	1.00
370 Office furniture- except wood- manufa	117	30	17,883	18,029	1.00
371 Showcases- partitions- shelving- and l	695	10,151	346,509	357,354	1.00
372 Mattress manufacturing	455,039	247	233,872	689,157	1.00
373 Blind and shade manufacturing	63,605	147	21,657	85,408	1.00
374 Laboratory apparatus and furniture ma	4,322	9,103	286,678	300,103	1.00
375 Surgical and medical instrument manu	33,592	539,251	575,737	1,148,580	1.00
376 Surgical appliance and supplies manuf	387,981	578,435	711,759	1,678,175	1.00
377 Dental equipment and supplies manufa	1,888	152,737	157,853	312,478	1.00
378 Ophthalmic goods manufacturing	173,214	-1,837	53,592	224,969	1.00
379 Dental laboratories	0	338,483	105,789	444,272	1.00
380 Jewelry and silverware manufacturing	85,390	1,723	29,919	117,032	1.00
381 Sporting and athletic goods manufactu	7,950	541	3,246	11,737	1.00
382 Doll- toy- and game manufacturing	1,227,091	54,497	417,785	1,699,373	1.00
383 Office supplies- except paper- manufa	10,465	1,225	4,947	16,636	1.00
384 Sign manufacturing	525	-4,920	69,661	65,267	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

Industry	Direct*	Indirect*	Induced*	Total*	Deflator
385 Gasket- packing- and sealing device	819	1,930	4,543	7,292	1.00
386 Musical instrument manufacturing	144,604	8,292	79,507	232,402	1.00
387 Broom- brush- and mop manufacturing	16,106	6,012	14,015	36,133	1.00
388 Burial casket manufacturing	0	311	86	397	1.00
389 Buttons- pins- and all other miscella	17,437	8,140	15,001	40,578	1.00
390 Wholesale trade	-29,787,386	457,116	1,757,669	-27,572,600	1.00
391 Air transportation	689,126	117,061	353,140	1,159,326	1.00
392 Rail transportation	-3,931,774	1,532,985	397,662	-2,001,127	1.00
393 Water transportation	-2,756,479	165,907	398,418	-2,192,153	1.00
394 Truck transportation	-3,829,296	1,084,478	3,631,107	886,289	1.00
395 Transit and ground passenger transpor	221,658	39,365	122,076	383,100	1.00
396 Pipeline transportation	-1,226,103	944,563	78,216	-203,324	1.00
397 Scenic and sightseeing transportation	133,639	-369,171	393,134	157,603	1.00
398 Postal service	470,875	766,705	812,934	2,050,514	1.00
399 Couriers and messengers	0	34,904	462,010	496,914	1.00
400 Warehousing and storage	39,971	-257,860	363,135	145,246	1.00
401 Motor vehicle and parts dealers	14,373,861	186,681	5,083,906	19,644,448	1.00
402 Furniture and home furnishings stores	3,293,121	52,320	1,180,077	4,525,518	1.00
403 Electronics and appliance stores	2,012,543	36,876	779,900	2,829,320	1.00
404 Building material and garden supply s	7,090,720	110,269	2,550,785	9,751,773	1.00
405 Food and beverage stores	11,429,621	149,718	4,070,913	15,650,252	1.00
406 Health and personal care stores	5,095,453	81,740	1,839,777	7,016,969	1.00
407 Gasoline stations	-186,628,160	67,056	1,570,830	-184,990,272	1.00
408 Clothing and clothing accessories stor	6,307,483	76,501	2,197,975	8,581,958	1.00
409 Sporting goods- hobby- book and musi	2,434,276	33,943	890,136	3,358,355	1.00
410 General merchandise stores	9,320,521	121,964	3,267,730	12,710,215	1.00
411 Miscellaneous store retailers	3,607,991	47,192	1,292,398	4,947,581	1.00
412 Nonstore retailers	7,260,763	111,039	2,580,355	9,952,156	1.00
413 Newspaper publishers	256,153	-32,686	404,897	628,364	1.00
414 Periodical publishers	246,950	35,301	239,345	521,596	1.00
415 Book publishers	343,716	76,813	194,333	614,862	1.00
416 Database- directory- and other publish	202,212	39,639	380,410	622,261	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Cleveland EV 2008 090908.iap

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
417 Software publishers	353,501	18,954	235,312	607,767	1.00
418 Motion picture and video industries	558,435	450,306	396,390	1,405,130	1.00
419 Sound recording industries	217,929	31,917	79,499	329,345	1.00
420 Radio and television broadcasting	169,541	44,664	338,967	553,173	1.00
421 Cable networks and program distribut	194,694	6,474	68,166	269,335	1.00
422 Telecommunications	6,212,755	1,901,095	3,968,930	12,082,780	1.00
423 Information services	138,691	69,141	127,831	335,663	1.00
424 Data processing services	4,910	81,567	157,477	243,954	1.00
425 Nondepository credit intermediation an	1,926,236	1,086,654	1,914,326	4,927,216	1.00
426 Securities- commodity contracts- inve	3,785,524	4,425,924	3,142,750	11,354,198	1.00
427 Insurance carriers	11,418,636	2,672,728	4,969,108	19,060,472	1.00
428 Insurance agencies- brokerages- and r	0	3,091,644	1,089,631	4,181,275	1.00
429 Funds- trusts- and other financial vehi	3,509,625	78,024	1,207,941	4,795,591	1.00
430 Monetary authorities and depository c	13,104,654	1,665,363	5,319,972	20,089,988	1.00
431 Real estate	16,323,595	9,554,249	13,289,973	39,167,816	1.00
432 Automotive equipment rental and leas	1,354,661	195,296	667,351	2,217,309	1.00
433 Video tape and disc rental	409,181	306	132,415	541,901	1.00
434 Machinery and equipment rental and l	8,618	241,609	410,573	660,800	1.00
435 General and consumer goods rental ex	207,273	37,801	166,604	411,679	1.00
436 Lessors of nonfinancial intangible asse	0	610,442	444,538	1,054,980	1.00
437 Legal services	4,179,458	3,403,323	3,055,116	10,637,897	1.00
438 Accounting and bookkeeping services	285,927	1,289,065	1,546,424	3,121,416	1.00
439 Architectural and engineering services	2,071	1,236,789	2,714,467	3,953,327	1.00
440 Specialized design services	37,823	149,096	235,613	422,531	1.00
441 Custom computer programming servic	7,856	38,973	2,244,034	2,290,863	1.00
442 Computer systems design services	39,740	303,422	624,013	967,174	1.00
443 Other computer related services- includ	31,720	198,663	338,070	568,454	1.00
444 Management consulting services	45,519	1,052,947	1,306,644	2,405,110	1.00
445 Environmental and other technical cons	60	-93,829	366,314	272,545	1.00
446 Scientific research and development s	671,440	394,251	905,010	1,970,701	1.00
447 Advertising and related services	7,544	-84,368	765,724	688,900	1.00
448 Photographic services	358,029	51,671	148,120	557,820	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
449 Veterinary services	1,860,640	88,229	633,082	2,581,951	1.00
450 All other miscellaneous professional a	0	1,056,140	779,890	1,836,030	1.00
451 Management of companies and enterpr	0	-1,680,218	2,558,551	878,333	1.00
452 Office administrative services	1,370	1,074,411	899,934	1,975,714	1.00
453 Facilities support services	17	39,971	126,149	166,137	1.00
454 Employment services	49,868	1,514,406	1,280,347	2,844,622	1.00
455 Business support services	224,698	661,738	595,757	1,482,193	1.00
456 Travel arrangement and reservation se	551,338	125,648	291,194	968,180	1.00
457 Investigation and security services	47,632	290,526	617,632	955,790	1.00
458 Services to buildings and dwellings	530,127	1,524,180	1,360,077	3,414,384	1.00
459 Other support services	31,876	188,990	353,038	573,904	1.00
460 Waste management and remediation se	176,619	510,802	546,901	1,234,322	1.00
461 Elementary and secondary schools	2,463,208	0	877,993	3,341,201	1.00
462 Colleges- universities- and junior coll	5,829,869	204,032	2,037,128	8,071,029	1.00
463 Other educational services	2,517,754	206,929	932,481	3,657,164	1.00
464 Home health care services	4,509,598	0	1,396,354	5,905,952	1.00
465 Offices of physicians- dentists- and ot	33,640,856	0	10,238,295	43,879,152	1.00
466 Other ambulatory health care services	9,043,594	636,703	3,080,650	12,760,947	1.00
467 Hospitals	39,129,608	0	11,965,407	51,095,016	1.00
468 Nursing and residential care facilities	10,107,682	0	3,121,650	13,229,332	1.00
469 Child day care services	3,733,573	0	1,235,852	4,969,425	1.00
470 Social assistance- except child day ca	5,507,473	12	1,814,021	7,321,506	1.00
471 Performing arts companies	436,156	230,888	224,196	891,240	1.00
472 Spectator sports	853,830	218,507	429,007	1,501,343	1.00
473 Independent artists- writers- and perf	2,015	85,901	47,248	135,164	1.00
474 Promoters of performing arts and spor	491,368	125,864	239,020	856,251	1.00
475 Museums- historical sites- zoos- and	594,423	0	188,148	782,571	1.00
476 Fitness and recreational sports centers	1,066,646	32,174	368,511	1,467,331	1.00
477 Bowling centers	269,509	19,120	97,088	385,717	1.00
478 Other amusement- gambling- and recrea	3,973,977	28,564	1,307,202	5,309,743	1.00
479 Hotels and motels- including casino ho	1,909,645	452,135	1,111,187	3,472,967	1.00
480 Other accommodations	317,802	2,549	107,242	427,593	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Cleveland EV 2008 090908.iap

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
481 Food services and drinking places	27,610,668	1,640,638	9,654,753	38,906,060	1.00
482 Car washes	606,489	14,000	223,487	843,976	1.00
483 Automotive repair and maintenance- e	4,924,609	201,987	1,948,894	7,075,490	1.00
484 Electronic equipment repair and main	84,959	39,939	378,463	503,360	1.00
485 Commercial machinery repair and mai	0	113,067	287,313	400,380	1.00
486 Household goods repair and maintena	557,232	94,849	338,130	990,210	1.00
487 Personal care services	3,487,577	108,728	1,100,053	4,696,358	1.00
488 Death care services	1,077,191	0	298,268	1,375,459	1.00
489 Drycleaning and laundry services	945,051	273,695	497,626	1,716,372	1.00
490 Other personal services	3,811,192	54,260	1,337,141	5,202,593	1.00
491 Religious organizations	1,697,755	0	535,119	2,232,874	1.00
492 Grantmaking and giving and social ad	1,972,194	0	650,407	2,622,601	1.00
493 Civic- social- professional and similar	2,635,383	978,725	1,322,144	4,936,252	1.00
494 Private households	1,225,981	0	398,485	1,624,466	1.00
495 Federal electric utilities	0	0	0	0	1.00
496 Other Federal Government enterprises	-904	2,274	3,623	4,993	1.00
497 State and local government passenger t	587,229	104,289	323,409	1,014,928	1.00
498 State and local government electric uti	29,853,722	115,636	640,839	30,610,196	1.00
499 Other State and local government ente	5,559,140	1,160,944	2,533,388	9,253,472	1.00
500 Noncomparable imports	0	0	0	0	1.00
501 Scrap	0	0	0	0	1.00
502 Used and secondhand goods	0	0	0	0	1.00
503 State & Local Education	0	0	15,430,112	15,430,112	1.00
504 State & Local Non-Education	0	0	12,514,118	12,514,118	1.00
505 Federal Military	0	0	1,610,600	1,610,600	1.00
506 Federal Non-Military	0	0	7,000,681	7,000,681	1.00
507 Rest of the world adjustment to final	0	0	0	0	1.00
508 Inventory valuation adjustment	0	0	0	0	1.00
509 Owner-occupied dwellings	78,681,584	0	25,424,496	104,106,080	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Cleveland EV 2008 090908.iap

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
11001 Federal Government NonDefense	11,505	0	0	11,505	1.00
11003 Federal Government Investment	11,271	0	0	11,271	1.00
12001 State/Local Govt NonEducation	15,573,097	0	0	15,573,097	1.00
12003 State/Local Govt Investment	172,865	0	0	172,865	1.00
14001 Capital	1,342,985	0	0	1,342,985	1.00
14002 Inventory Additions/Deletions	34,160	0	0	34,160	1.00
25001 Foreign Trade	-3,301,461	0	0	-3,301,461	1.00
28001 Domestic Trade	-391,700,800	0	0	-391,700,800	1.00
Total	-8	78,915,766	300,537,011	379,452,768	

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:
Cleveland EV 2008 090908.iap

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
1 Oilseed farming	0.0	0.0	0.0	0.0
2 Grain farming	0.1	0.1	0.1	0.2
3 Vegetable and melon farming	0.8	0.0	0.3	1.1
4 Tree nut farming	0.0	0.0	0.0	0.0
5 Fruit farming	0.5	0.0	0.2	0.7
6 Greenhouse and nursery production	5.4	1.2	2.7	9.2
7 Tobacco farming	0.0	0.0	0.0	0.0
8 Cotton farming	0.0	0.0	0.0	0.0
9 Sugarcane and sugar beet farming	0.0	0.0	0.0	0.0
10 All other crop farming	0.0	0.1	0.1	0.2
11 Cattle ranching and farming	0.1	4.4	1.5	6.0
12 Poultry and egg production	0.1	0.0	0.0	0.1
13 Animal production- except cattle and	1.9	1.0	0.9	3.8
14 Logging	0.0	0.0	0.1	0.1
15 Forest nurseries- forest products- and	0.0	0.0	0.0	0.0
16 Fishing	0.0	0.0	0.0	0.0
17 Hunting and trapping	0.2	0.0	0.1	0.2
18 Agriculture and forestry support activi	0.1	0.1	0.1	0.3
19 Oil and gas extraction	-22.9	48.2	4.3	29.6
20 Coal mining	0.0	0.0	0.0	0.0
21 Iron ore mining	0.0	0.0	0.0	0.0
22 Copper- nickel- lead- and zinc mining	0.0	0.0	0.0	0.0
23 Gold- silver- and other metal ore mini	0.0	0.0	0.0	0.0
24 Stone mining and quarrying	0.0	0.0	0.0	0.0
25 Sand- gravel- clay- and refractory min	0.0	0.0	0.0	0.0
26 Other nonmetallic mineral mining	0.0	0.0	0.1	0.1
27 Drilling oil and gas wells	0.0	0.0	0.2	0.2
28 Support activities for oil and gas oper	0.0	0.3	0.3	0.5
29 Support activities for other mining	0.0	0.0	0.0	0.0
30 Power generation and supply	344.1	1.4	8.0	353.6
31 Natural gas distribution	3.4	0.1	1.5	5.0
32 Water- sewage and other systems	1.9	0.7	0.8	3.4
33 New residential 1-unit structures- all	0.0	0.0	78.8	78.8
34 New multifamily housing structures- a	0.0	0.0	12.3	12.3
35 New residential additions and alteratio	0.0	0.0	17.7	17.7
36 New farm housing units	0.0	0.0	0.0	0.0
37 Manufacturing and industrial building	0.0	0.0	14.6	14.6
38 Commercial and institutional building	0.0	0.0	81.1	81.1
39 Highway- street- bridge- and tunnel co	0.0	0.0	14.4	14.4
40 Water- sewer- and pipeline constructi	0.0	0.0	8.0	8.0
41 Other new construction	0.0	0.0	23.3	23.3
42 Maintenance and repair of farm and n	0.0	4.0	5.5	9.5
43 Maintenance and repair of nonresidenti	0.0	10.9	9.4	20.3
44 Maintenance and repair of highways- st	0.0	0.0	6.6	6.6
45 Other maintenance and repair construc	0.0	35.7	3.6	39.2
46 Dog and cat food manufacturing	0.0	0.0	0.0	0.0
47 Other animal food manufacturing	0.0	0.0	0.0	0.0
48 Flour milling	0.0	0.0	0.0	0.1
49 Rice milling	0.0	0.0	0.0	0.0
50 Malt manufacturing	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine
Cleveland EV 2008 090908.iap MULTIPLIER:

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
51 Wet corn milling	0.0	0.0	0.0	0.0
52 Soybean processing	0.0	0.0	0.0	0.0
53 Other oilseed processing	0.0	0.0	0.0	0.0
54 Fats and oils refining and blending	0.0	0.0	0.0	0.0
55 Breakfast cereal manufacturing	0.0	0.0	0.0	0.0
56 Sugar manufacturing	0.0	0.0	0.0	0.0
57 Confectionery manufacturing from ca	0.0	0.0	0.0	0.0
58 Confectionery manufacturing from pu	0.1	0.0	0.0	0.1
59 Nonchocolate confectionery manufact	0.0	0.0	0.0	0.1
60 Frozen food manufacturing	0.2	0.1	0.1	0.4
61 Fruit and vegetable canning and dryin	0.1	0.0	0.0	0.1
62 Fluid milk manufacturing	2.0	0.6	1.0	3.6
63 Creamery butter manufacturing	0.0	0.0	0.0	0.0
64 Cheese manufacturing	1.0	0.6	0.5	2.1
65 Dry- condensed- and evaporated dairy	0.0	0.0	0.0	0.0
66 Ice cream and frozen dessert manufact	0.1	0.1	0.1	0.2
67 Animal- except poultry- slaughtering	0.0	0.0	0.0	0.1
68 Meat processed from carcasses	0.4	0.1	0.2	0.6
69 Rendering and meat byproduct proces	0.0	0.0	0.0	0.0
70 Poultry processing	0.8	0.2	0.3	1.2
71 Seafood product preparation and pack	0.0	0.0	0.0	0.0
72 Frozen cakes and other pastries manuf	0.6	0.1	0.2	0.9
73 Bread and bakery product- except fro	9.8	2.9	4.2	16.9
74 Cookie and cracker manufacturing	0.5	0.0	0.2	0.7
75 Mixes and dough made from purchased	1.2	0.2	0.4	1.7
76 Dry pasta manufacturing	0.0	0.0	0.0	0.0
77 Tortilla manufacturing	0.0	0.0	0.0	0.1
78 Roasted nuts and peanut butter manufa	0.1	0.0	0.0	0.1
79 Other snack food manufacturing	0.8	0.3	0.3	1.4
80 Coffee and tea manufacturing	0.0	0.0	0.0	0.0
81 Flavoring syrup and concentrate manu	0.0	0.1	0.0	0.1
82 Mayonnaise- dressing- and sauce manu	0.4	0.1	0.2	0.7
83 Spice and extract manufacturing	0.6	0.2	0.3	1.0
84 All other food manufacturing	1.5	0.2	0.5	2.2
85 Soft drink and ice manufacturing	0.3	0.1	0.1	0.5
86 Breweries	0.0	0.0	0.0	0.0
87 Wineries	0.0	0.0	0.0	0.1
88 Distilleries	0.0	0.0	0.0	0.0
89 Tobacco stemming and redrying	0.0	0.0	0.0	0.0
90 Cigarette manufacturing	0.0	0.0	0.0	0.0
91 Other tobacco product manufacturing	0.0	0.0	0.0	0.0
92 Fiber- yarn- and thread mills	0.0	0.0	0.0	0.0
93 Broadwoven fabric mills	0.0	0.0	0.0	0.0
94 Narrow fabric mills and schiffli embro	0.0	0.0	0.0	0.0
95 Nonwoven fabric mills	0.0	0.0	0.0	0.0
96 Knit fabric mills	0.0	0.0	0.0	0.0
97 Textile and fabric finishing mills	0.0	0.0	0.0	0.0
98 Fabric coating mills	0.0	0.0	0.0	0.0
99 Carpet and rug mills	0.0	0.0	0.0	0.0
100 Curtain and linen mills	0.6	0.0	0.2	0.9

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:
Cleveland EV 2008 090908.iap

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
101 Textile bag and canvas mills	0.1	0.0	0.0	0.1
102 Tire cord and tire fabric mills	0.0	0.0	0.0	0.0
103 Other miscellaneous textile product mi	0.0	0.0	0.0	0.0
104 Sheer hosiery mills	0.0	0.0	0.0	0.0
105 Other hosiery and sock mills	0.0	0.0	0.0	0.0
106 Other apparel knitting mills	0.0	0.0	0.0	0.0
107 Cut and sew apparel manufacturing	8.2	0.1	2.7	11.1
108 Accessories and other apparel manufa	0.0	0.0	0.0	0.0
109 Leather and hide tanning and finishing	0.0	0.0	0.0	0.0
110 Footwear manufacturing	0.4	0.0	0.1	0.5
111 Other leather product manufacturing	0.2	0.0	0.1	0.3
112 Sawmills	0.0	0.1	0.1	0.2
113 Wood preservation	0.0	0.0	0.0	0.0
114 Reconstituted wood product manufact	0.0	0.0	0.0	0.0
115 Veneer and plywood manufacturing	0.0	0.0	0.0	0.0
116 Engineered wood member and truss ma	0.0	0.2	0.4	0.6
117 Wood windows and door manufacturi	0.0	0.3	0.7	1.0
118 Cut stock- resawing lumber- and plani	0.0	0.0	0.0	0.0
119 Other millwork- including flooring	0.0	0.6	1.4	2.0
120 Wood container and pallet manufactur	0.3	-0.9	0.5	-0.1
121 Manufactured home- mobile home- ma	0.0	0.0	0.0	0.0
122 Prefabricated wood building manufact	0.0	0.0	0.0	0.0
123 Miscellaneous wood product manufact	0.2	0.1	0.1	0.3
124 Pulp mills	0.0	0.0	0.0	0.0
125 Paper and paperboard mills	0.0	0.0	0.0	0.0
126 Paperboard container manufacturing	0.0	0.0	0.0	0.1
127 Flexible packaging foil manufacturing	0.0	0.0	0.0	0.0
128 Surface-coated paperboard manufactu	0.0	0.0	0.0	0.0
129 Coated and laminated paper and packa	0.1	0.2	0.2	0.5
130 Coated and uncoated paper bag manuf	0.0	0.0	0.0	0.0
131 Die-cut paper office supplies manufac	0.0	0.0	0.0	0.0
132 Envelope manufacturing	0.0	0.0	0.0	0.0
133 Stationery and related product manufa	0.0	0.0	0.0	0.0
134 Sanitary paper product manufacturing	0.0	0.0	0.0	0.0
135 All other converted paper product man	0.0	0.0	0.0	0.0
136 Manifold business forms printing	0.0	0.1	0.2	0.3
137 Books printing	0.0	0.0	0.0	0.0
138 Blankbook and looseleaf binder manuf	0.3	0.1	0.2	0.6
139 Commercial printing	0.8	1.1	4.0	5.9
140 Tradebinding and related work	0.0	0.1	0.1	0.2
141 Prepress services	0.0	0.1	0.1	0.1
142 Petroleum refineries	0.0	0.0	0.0	0.0
143 Asphalt paving mixture and block man	0.0	0.1	0.3	0.5
144 Asphalt shingle and coating materials	0.0	0.2	0.3	0.5
145 Petroleum lubricating oil and grease	0.0	0.0	0.2	0.2
146 All other petroleum and coal products	0.0	0.0	0.0	0.0
147 Petrochemical manufacturing	-3.9	-1.0	0.2	-4.8
148 Industrial gas manufacturing	0.0	0.2	0.1	0.3
149 Synthetic dye and pigment manufactur	0.0	0.1	0.1	0.2
150 Other basic inorganic chemical manufa	0.0	0.1	0.2	0.2

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:
Cleveland EV 2008 090908.iap

Copyright MIG 2008

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
151 Other basic organic chemical manufac	0.0	-0.1	0.2	0.1
152 Plastics material and resin manufactur	0.0	-0.2	0.0	-0.1
153 Synthetic rubber manufacturing	0.0	0.0	0.0	0.0
154 Cellulosic organic fiber manufacturing	0.0	0.0	0.0	0.0
155 Noncellulosic organic fiber manufactu	0.0	0.0	0.0	0.0
156 Nitrogenous fertilizer manufacturing	0.0	0.0	0.0	0.0
157 Phosphatic fertilizer manufacturing	0.0	0.0	0.0	0.0
158 Fertilizer- mixing only- manufacturing	0.0	0.0	0.0	0.0
159 Pesticide and other agricultural chemi	0.0	0.0	0.0	0.0
160 Pharmaceutical and medicine manufac	7.3	2.3	3.1	12.7
161 Paint and coating manufacturing	0.0	0.0	0.0	0.0
162 Adhesive manufacturing	0.1	0.2	0.3	0.6
163 Soap and other detergent manufacturin	1.2	0.2	0.5	1.9
164 Polish and other sanitation good manu	0.8	0.1	0.4	1.3
165 Surface active agent manufacturing	0.0	0.0	0.0	0.0
166 Toilet preparation manufacturing	2.3	0.3	0.8	3.4
167 Printing ink manufacturing	0.0	0.0	0.1	0.1
168 Explosives manufacturing	0.0	0.0	0.0	0.0
169 Custom compounding of purchased res	0.0	0.1	0.2	0.3
170 Photographic film and chemical manuf	0.1	0.2	0.4	0.8
171 Other miscellaneous chemical product	0.1	0.4	0.3	0.8
172 Plastics packaging materials- film and	0.5	0.5	0.8	1.8
173 Plastics pipe- fittings- and profile sha	0.0	1.0	0.8	1.8
174 Laminated plastics plate- sheet- and s	0.0	0.2	0.2	0.4
175 Plastics bottle manufacturing	0.0	0.7	0.3	1.0
176 Resilient floor covering manufacturing	0.0	0.0	0.1	0.1
177 Plastics plumbing fixtures and all othe	2.1	4.0	4.7	10.8
178 Foam product manufacturing	0.3	1.6	1.0	2.9
179 Tire manufacturing	0.0	0.0	0.0	0.0
180 Rubber and plastics hose and belting	0.0	0.0	0.0	0.1
181 Other rubber product manufacturing	0.0	0.1	0.1	0.2
182 Vitreous china plumbing fixture manuf	0.0	0.0	0.0	0.0
183 Vitreous china and earthenware articl	0.3	0.0	0.1	0.4
184 Porcelain electrical supply manufactur	0.0	0.0	0.0	0.0
185 Brick and structural clay tile manufac	0.0	0.0	0.0	0.0
186 Ceramic wall and floor tile manufactu	0.0	0.0	0.0	0.0
187 Nonclay refractory manufacturing	0.0	0.0	0.0	0.0
188 Clay refractory and other structural c	0.0	0.0	0.0	0.0
189 Glass container manufacturing	0.0	0.0	0.0	0.0
190 Glass and glass products- except glass	0.4	0.7	0.7	1.8
191 Cement manufacturing	0.0	0.0	0.0	0.0
192 Ready-mix concrete manufacturing	0.0	0.0	0.0	0.0
193 Concrete block and brick manufacturi	0.0	0.0	0.0	0.0
194 Concrete pipe manufacturing	0.0	0.0	0.0	0.0
195 Other concrete product manufacturing	0.0	0.0	0.0	0.0
196 Lime manufacturing	0.0	0.0	0.0	0.0
197 Gypsum product manufacturing	0.0	0.0	0.0	0.0
198 Abrasive product manufacturing	0.0	0.0	0.0	0.0
199 Cut stone and stone product manufact	0.2	0.0	0.6	0.8
200 Ground or treated minerals and earths	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:
Cleveland EV 2008 090908.iap

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
201 Mineral wool manufacturing	0.0	0.0	0.0	0.0
202 Miscellaneous nonmetallic mineral pr	0.0	0.0	0.0	0.0
203 Iron and steel mills	0.0	0.0	0.1	0.1
204 Ferroalloy and related product manufa	0.0	0.0	0.0	0.0
205 Iron- steel pipe and tube from purchas	0.0	0.0	0.0	0.0
206 Rolled steel shape manufacturing	0.0	0.0	0.0	0.1
207 Steel wire drawing	0.0	0.0	0.0	0.1
208 Alumina refining	0.0	0.0	0.0	0.0
209 Primary aluminum production	0.0	0.0	0.0	0.0
210 Secondary smelting and alloying of a	0.0	0.0	0.0	0.0
211 Aluminum sheet- plate- and foil manuf	0.0	0.0	0.0	0.0
212 Aluminum extruded product manufact	0.0	0.0	0.0	0.0
213 Other aluminum rolling and drawing	0.0	0.0	0.0	0.0
214 Primary smelting and refining of copp	0.0	0.0	0.0	0.0
215 Primary nonferrous metal- except cop	0.0	0.0	0.0	0.0
216 Copper rolling- drawing- and extrudin	0.0	0.0	0.0	0.0
217 Copper wire- except mechanical- draw	0.0	0.0	0.1	0.1
218 Secondary processing of copper	0.0	0.0	0.0	0.0
219 Nonferrous metal- except copper and	0.0	0.0	0.0	0.1
220 Secondary processing of other nonferr	0.0	0.1	0.0	0.1
221 Ferrous metal foundries	0.0	0.0	0.0	0.0
222 Aluminum foundries	0.0	0.0	0.0	0.1
223 Nonferrous foundries- except alumin	0.0	0.0	0.0	0.0
224 Iron and steel forging	0.0	0.0	0.1	0.1
225 Nonferrous forging	0.0	0.0	0.0	0.0
226 Custom roll forming	0.0	0.0	0.0	0.0
227 All other forging and stamping	0.0	0.1	0.2	0.3
228 Cutlery and flatware- except precious	0.0	0.0	0.0	0.0
229 Hand and edge tool manufacturing	0.3	0.1	0.3	0.6
230 Saw blade and handsaw manufacturin	0.0	0.0	0.1	0.2
231 Kitchen utensil- pot- and pan manufac	0.9	0.1	0.3	1.4
232 Prefabricated metal buildings and co	0.0	0.0	0.0	0.0
233 Fabricated structural metal manufactu	0.0	0.0	0.0	0.0
234 Plate work manufacturing	0.0	0.0	0.0	0.0
235 Metal window and door manufacturing	0.0	0.0	0.0	0.0
236 Sheet metal work manufacturing	0.0	0.0	0.0	0.0
237 Ornamental and architectural metal w	0.0	0.0	0.0	0.0
238 Power boiler and heat exchanger manu	0.0	0.0	0.1	0.1
239 Metal tank- heavy gauge- manufacturi	0.0	0.0	0.0	0.0
240 Metal can- box- and other container m	0.0	0.0	0.0	0.1
241 Hardware manufacturing	0.0	0.0	0.0	0.0
242 Spring and wire product manufacturin	0.0	0.1	0.2	0.3
243 Machine shops	0.0	1.1	1.3	2.4
244 Turned product and screw- nut- and b	0.0	0.3	0.5	0.8
245 Metal heat treating	0.0	0.1	0.1	0.1
246 Metal coating and nonprecious engrav	0.0	0.1	0.1	0.2
247 Electroplating- anodizing- and colorin	0.0	0.3	0.3	0.6
248 Metal valve manufacturing	0.0	0.0	0.5	0.5
249 Ball and roller bearing manufacturing	0.0	0.0	0.0	0.1
250 Small arms manufacturing	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:
Cleveland EV 2008 090908.iap

Copyright MIG 2008

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
251 Other ordnance and accessories manuf	0.0	0.0	0.0	0.0
252 Fabricated pipe and pipe fitting manuf	0.0	0.0	0.2	0.2
253 Industrial pattern manufacturing	0.0	0.0	0.0	0.0
254 Enameled iron and metal sanitary war	0.0	0.0	0.0	0.0
255 Miscellaneous fabricated metal produ	0.0	0.0	0.0	0.0
256 Ammunition manufacturing	0.0	0.0	0.0	0.0
257 Farm machinery and equipment manufa	0.0	0.0	0.1	0.2
258 Lawn and garden equipment manufactu	0.2	0.1	1.7	1.9
259 Construction machinery manufacturin	0.0	0.0	0.1	0.1
260 Mining machinery and equipment manu	0.0	0.0	0.2	0.2
261 Oil and gas field machinery and equi	0.0	0.0	0.0	0.0
262 Sawmill and woodworking machinery	0.1	0.0	0.1	0.2
263 Plastics and rubber industry machiner	0.0	0.0	0.5	0.5
264 Paper industry machinery manufacturi	0.0	0.0	0.1	0.1
265 Textile machinery manufacturing	0.0	0.0	0.1	0.1
266 Printing machinery and equipment man	0.0	0.0	0.2	0.2
267 Food product machinery manufacturin	0.0	0.0	0.2	0.2
268 Semiconductor machinery manufacturi	0.0	0.0	0.0	0.0
269 All other industrial machinery manufa	0.1	0.0	1.5	1.6
270 Office machinery manufacturing	0.0	0.0	0.0	0.0
271 Optical instrument and lens manufactu	0.0	0.0	0.1	0.1
272 Photographic and photocopying equip	0.0	0.0	0.0	0.0
273 Other commercial and service industr	0.0	0.0	1.5	1.5
274 Automatic vending- commercial laund	0.0	0.0	0.0	0.0
275 Air purification equipment manufactur	0.0	0.0	0.0	0.0
276 Industrial and commercial fan and bl	0.0	0.0	0.0	0.0
277 Heating equipment- except warm air f	0.0	0.0	0.0	0.0
278 AC- refrigeration- and forced air heati	0.0	0.0	0.0	0.0
279 Industrial mold manufacturing	0.0	0.0	0.2	0.2
280 Metal cutting machine tool manufactur	0.0	0.0	0.5	0.6
281 Metal forming machine tool manufactu	0.0	0.0	0.0	0.0
282 Special tool- die- jig- and fixture man	0.0	0.1	5.1	5.2
283 Cutting tool and machine tool accesso	0.0	0.0	0.2	0.2
284 Rolling mill and other metalworking m	0.0	0.0	1.0	1.0
285 Turbine and turbine generator set unit	0.0	0.0	0.0	0.0
286 Other engine equipment manufacturin	0.0	0.1	0.1	0.2
287 Speed changers and mechanical power	0.0	0.1	0.5	0.6
288 Pump and pumping equipment manufac	0.0	0.0	0.0	0.0
289 Air and gas compressor manufacturin	0.0	0.0	0.0	0.0
290 Measuring and dispensing pump manuf	0.0	0.0	0.0	0.0
291 Elevator and moving stairway manufac	0.0	0.0	0.1	0.1
292 Conveyor and conveying equipment m	0.0	0.0	0.8	0.8
293 Overhead cranes- hoists- and monorai	0.0	0.0	0.4	0.4
294 Industrial truck- trailer- and stacker m	0.0	0.0	1.0	1.0
295 Power-driven handtool manufacturing	0.1	0.0	0.3	0.5
296 Welding and soldering equipment man	0.0	0.1	7.5	7.6
297 Packaging machinery manufacturing	0.0	0.0	0.9	0.9
298 Industrial process furnace and oven m	0.0	0.0	0.0	0.0
299 Fluid power cylinder and actuator man	0.0	0.0	0.0	0.0
300 Fluid power pump and motor manufact	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:
Cleveland EV 2008 090908.iap

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
301 Scales- balances- and miscellaneous g	0.0	0.0	0.6	0.6
302 Electronic computer manufacturing	0.5	0.0	0.2	0.7
303 Computer storage device manufacturi	0.1	0.1	0.1	0.3
304 Computer terminal manufacturing	0.0	0.1	0.1	0.2
305 Other computer peripheral equipment	0.1	0.0	0.1	0.2
306 Telephone apparatus manufacturing	0.1	0.0	1.2	1.3
307 Broadcast and wireless communicatio	0.1	0.0	0.5	0.6
308 Other communications equipment manu	0.0	0.0	0.2	0.2
309 Audio and video equipment manufactu	0.0	0.0	0.0	0.1
310 Electron tube manufacturing	0.0	0.0	0.0	0.0
311 Semiconductors and related device ma	0.0	0.0	0.0	0.0
312 All other electronic component manufa	0.3	0.5	1.2	2.0
313 Electromedical apparatus manufacturi	0.1	0.7	1.2	2.1
314 Search- detection- and navigation inst	0.0	0.0	0.0	0.0
315 Automatic environmental control manu	0.0	0.0	0.1	0.1
316 Industrial process variable instrument	0.0	0.0	0.9	0.9
317 Totalizing fluid meters and counting d	0.0	0.0	0.0	0.0
318 Electricity and signal testing instrumen	0.0	0.0	0.5	0.5
319 Analytical laboratory instrument manu	0.0	0.0	0.0	0.0
320 Irradiation apparatus manufacturing	0.0	0.0	0.4	0.5
321 Watch- clock- and other measuring and	0.1	0.0	0.1	0.2
322 Software reproducing	0.0	0.0	0.1	0.1
323 Audio and video media reproduction	0.0	0.0	0.0	0.0
324 Magnetic and optical recording media	0.0	0.0	0.0	0.0
325 Electric lamp bulb and part manufactu	0.0	0.0	0.0	0.0
326 Lighting fixture manufacturing	0.0	0.0	0.0	0.0
327 Electric housewares and household fa	0.0	0.0	0.0	0.0
328 Household vacuum cleaner manufactu	0.8	0.0	0.5	1.3
329 Household cooking appliance manufac	0.0	0.0	0.0	0.0
330 Household refrigerator and home free	0.0	0.0	0.0	0.0
331 Household laundry equipment manufac	0.0	0.0	0.0	0.0
332 Other major household appliance manu	0.0	0.0	0.0	0.0
333 Electric power and specialty transfor	0.0	0.0	0.0	0.0
334 Motor and generator manufacturing	0.0	0.0	0.1	0.1
335 Switchgear and switchboard apparatus	0.0	0.2	0.4	0.6
336 Relay and industrial control manufactu	0.0	0.1	0.3	0.4
337 Storage battery manufacturing	0.0	0.0	0.0	0.1
338 Primary battery manufacturing	0.0	0.0	0.0	0.0
339 Fiber optic cable manufacturing	0.0	0.0	0.0	0.0
340 Other communication and energy wire	0.0	0.1	0.1	0.2
341 Wiring device manufacturing	0.0	0.0	0.0	0.0
342 Carbon and graphite product manufact	0.0	0.0	0.0	0.0
343 Miscellaneous electrical equipment m	0.1	0.0	0.3	0.4
344 Automobile and light truck manufactu	3.8	0.0	2.9	6.6
345 Heavy duty truck manufacturing	0.0	0.0	0.0	0.0
346 Motor vehicle body manufacturing	0.0	0.1	0.1	0.2
347 Truck trailer manufacturing	0.0	0.0	0.6	0.6
348 Motor home manufacturing	0.0	0.0	0.0	0.0
349 Travel trailer and camper manufacturi	0.3	0.0	0.1	0.4
350 Motor vehicle parts manufacturing	1.1	1.9	2.1	5.1

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:
Cleveland EV 2008 090908.iap

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
351 Aircraft manufacturing	0.0	0.0	0.0	0.0
352 Aircraft engine and engine parts manu	0.0	0.2	0.5	0.7
353 Other aircraft parts and equipment	0.0	0.0	0.3	0.3
354 Guided missile and space vehicle man	0.0	0.0	0.0	0.0
355 Propulsion units and parts for space v	0.0	0.0	0.0	0.0
356 Railroad rolling stock manufacturing	0.0	0.0	0.0	0.0
357 Ship building and repairing	0.0	0.0	0.0	0.0
358 Boat building	0.0	0.0	0.0	0.0
359 Motorcycle- bicycle- and parts manufa	0.1	0.0	0.1	0.2
360 Military armored vehicles and tank pa	0.0	0.0	0.0	0.0
361 All other transportation equipment ma	0.0	0.0	0.0	0.0
362 Wood kitchen cabinet and countertop	0.6	1.6	4.3	6.4
363 Upholstered household furniture manu	0.3	0.0	0.1	0.4
364 Nonupholstered wood household furni	2.0	0.0	0.7	2.8
365 Metal household furniture manufactur	0.1	0.0	0.0	0.2
366 Institutional furniture manufacturing	0.0	0.0	0.1	0.1
367 Other household and institutional furni	0.0	0.0	0.0	0.1
368 Wood office furniture manufacturing	0.0	0.0	0.3	0.3
369 Custom architectural woodwork and m	0.0	0.0	0.7	0.7
370 Office furniture- except wood- manufa	0.0	0.0	0.1	0.1
371 Showcases- partitions- shelving- and l	0.0	0.1	2.1	2.2
372 Mattress manufacturing	1.6	0.0	0.8	2.4
373 Blind and shade manufacturing	0.4	0.0	0.1	0.6
374 Laboratory apparatus and furniture ma	0.0	0.0	1.3	1.4
375 Surgical and medical instrument manu	0.1	2.0	2.1	4.2
376 Surgical appliance and supplies manuf	1.6	2.3	2.9	6.8
377 Dental equipment and supplies manufa	0.0	0.7	0.7	1.4
378 Ophthalmic goods manufacturing	0.9	0.0	0.3	1.2
379 Dental laboratories	0.0	3.6	1.1	4.8
380 Jewelry and silverware manufacturing	0.4	0.0	0.1	0.5
381 Sporting and athletic goods manufactu	0.0	0.0	0.0	0.1
382 Doll- toy- and game manufacturing	4.1	0.2	1.4	5.7
383 Office supplies- except paper- manufa	0.0	0.0	0.0	0.1
384 Sign manufacturing	0.0	0.0	0.6	0.5
385 Gasket- packing- and sealing device	0.0	0.0	0.0	0.0
386 Musical instrument manufacturing	1.3	0.1	0.7	2.0
387 Broom- brush- and mop manufacturing	0.1	0.0	0.1	0.2
388 Burial casket manufacturing	0.0	0.0	0.0	0.0
389 Buttons- pins- and all other miscella	0.1	0.0	0.1	0.2
390 Wholesale trade	-167.2	2.6	9.9	-154.8
391 Air transportation	3.0	0.5	1.6	5.1
392 Rail transportation	-15.8	6.2	1.6	-8.0
393 Water transportation	-4.7	0.3	0.7	-3.7
394 Truck transportation	-29.5	8.4	28.0	6.8
395 Transit and ground passenger transpor	5.3	0.9	2.9	9.2
396 Pipeline transportation	-2.0	1.6	0.1	-0.3
397 Scenic and sightseeing transportation	1.4	-3.9	4.2	1.7
398 Postal service	7.1	11.5	12.2	30.7
399 Couriers and messengers	0.0	0.5	7.0	7.6
400 Warehousing and storage	0.5	-3.5	4.9	2.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:
Cleveland EV 2008 090908.iap

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
401 Motor vehicle and parts dealers	147.0	1.9	52.0	200.9
402 Furniture and home furnishings stores	37.8	0.6	13.6	52.0
403 Electronics and appliance stores	36.8	0.7	14.3	51.7
404 Building material and garden supply s	86.8	1.4	31.2	119.4
405 Food and beverage stores	211.5	2.8	75.3	289.6
406 Health and personal care stores	77.9	1.2	28.1	107.2
407 Gasoline stations	-2,178.7	0.8	18.3	-2,159.5
408 Clothing and clothing accessories stor	105.5	1.3	36.8	143.6
409 Sporting goods- hobby- book and musi	46.4	0.6	17.0	64.0
410 General merchandise stores	182.0	2.4	63.8	248.2
411 Miscellaneous store retailers	88.4	1.2	31.7	121.2
412 Nonstore retailers	111.6	1.7	39.7	153.0
413 Newspaper publishers	2.2	-0.3	3.5	5.4
414 Periodical publishers	1.1	0.2	1.1	2.4
415 Book publishers	1.2	0.3	0.7	2.1
416 Database- directory- and other publish	0.7	0.1	1.3	2.1
417 Software publishers	1.2	0.1	0.8	2.1
418 Motion picture and video industries	4.0	3.2	2.9	10.1
419 Sound recording industries	0.7	0.1	0.3	1.1
420 Radio and television broadcasting	0.9	0.2	1.8	2.9
421 Cable networks and program distribut	0.2	0.0	0.1	0.3
422 Telecommunications	18.3	5.6	11.7	35.6
423 Information services	0.5	0.2	0.5	1.2
424 Data processing services	0.0	0.5	1.0	1.5
425 Nondepository credit intermediation an	13.8	7.8	13.7	35.2
426 Securities- commodity contracts- inve	29.9	35.0	24.8	89.7
427 Insurance carriers	45.6	10.7	19.9	76.1
428 Insurance agencies- brokerages- and r	0.0	22.5	7.9	30.5
429 Funds- trusts- and other financial vehi	13.3	0.3	4.6	18.1
430 Monetary authorities and depository c	45.1	5.7	18.3	69.1
431 Real estate	126.4	74.0	102.9	303.2
432 Automotive equipment rental and leas	8.1	1.2	4.0	13.2
433 Video tape and disc rental	8.0	0.0	2.6	10.6
434 Machinery and equipment rental and l	0.0	0.8	1.3	2.1
435 General and consumer goods rental ex	3.4	0.6	2.8	6.8
436 Lessors of nonfinancial intangible asse	0.0	0.3	0.2	0.5
437 Legal services	34.7	28.3	25.4	88.3
438 Accounting and bookkeeping services	2.8	12.6	15.2	30.6
439 Architectural and engineering services	0.0	10.8	23.6	34.4
440 Specialized design services	0.3	1.1	1.8	3.2
441 Custom computer programming servic	0.1	0.5	27.3	27.8
442 Computer systems design services	0.5	4.1	8.3	12.9
443 Other computer related services- includ	0.2	1.1	1.9	3.2
444 Management consulting services	0.3	7.9	9.7	17.9
445 Environmental and other technical cons	0.0	-0.6	2.4	1.8
446 Scientific research and development s	5.4	3.1	7.2	15.7
447 Advertising and related services	0.1	-0.7	6.6	5.9
448 Photographic services	5.0	0.7	2.1	7.8
449 Veterinary services	26.8	1.3	9.1	37.1
450 All other miscellaneous professional a	0.0	2.4	1.7	4.1

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:
Cleveland EV 2008 090908.iap

Copyright MIG 2008

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
451 Management of companies and enterpr	0.0	-8.8	13.4	4.6
452 Office administrative services	0.0	5.4	4.6	10.0
453 Facilities support services	0.0	0.7	2.2	2.8
454 Employment services	2.0	61.1	51.6	114.7
455 Business support services	2.6	7.7	6.9	17.3
456 Travel arrangement and reservation se	4.6	1.1	2.5	8.2
457 Investigation and security services	1.3	8.1	17.2	26.6
458 Services to buildings and dwellings	10.4	29.8	26.6	66.7
459 Other support services	0.3	1.6	2.9	4.7
460 Waste management and remediation se	1.0	3.0	3.2	7.2
461 Elementary and secondary schools	72.6	0.0	25.9	98.5
462 Colleges- universities- and junior coll	91.4	3.2	31.9	126.5
463 Other educational services	47.6	3.9	17.6	69.1
464 Home health care services	93.3	0.0	28.9	122.2
465 Offices of physicians- dentists- and ot	312.3	0.0	95.0	407.3
466 Other ambulatory health care services	69.1	4.9	23.5	97.5
467 Hospitals	345.2	0.0	105.6	450.8
468 Nursing and residential care facilities	209.3	0.0	64.7	274.0
469 Child day care services	101.3	0.0	33.5	134.9
470 Social assistance- except child day ca	166.1	0.0	54.7	220.8
471 Performing arts companies	19.3	10.2	9.9	39.4
472 Spectator sports	8.9	2.3	4.5	15.7
473 Independent artists- writers- and perf	0.0	1.3	0.7	2.1
474 Promoters of performing arts and spor	7.5	1.9	3.6	13.1
475 Museums- historical sites- zoos- and	8.8	0.0	2.8	11.5
476 Fitness and recreational sports centers	35.4	1.1	12.2	48.8
477 Bowling centers	5.7	0.4	2.1	8.2
478 Other amusement- gambling- and recrea	69.1	0.5	22.7	92.3
479 Hotels and motels- including casino ho	27.6	6.5	16.1	50.2
480 Other accommodations	3.2	0.0	1.1	4.3
481 Food services and drinking places	595.2	35.4	208.1	838.6
482 Car washes	12.3	0.3	4.5	17.1
483 Automotive repair and maintenance- e	58.9	2.4	23.3	84.7
484 Electronic equipment repair and main	0.6	0.3	2.6	3.4
485 Commercial machinery repair and mai	0.0	0.9	2.2	3.0
486 Household goods repair and maintena	3.1	0.5	1.9	5.5
487 Personal care services	66.8	2.1	21.1	89.9
488 Death care services	16.2	0.0	4.5	20.7
489 Drycleaning and laundry services	20.6	6.0	10.9	37.5
490 Other personal services	23.6	0.3	8.3	32.1
491 Religious organizations	12.5	0.0	4.0	16.5
492 Grantmaking and giving and social ad	41.5	0.0	13.7	55.1
493 Civic- social- professional and similar	69.4	25.8	34.8	130.0
494 Private households	142.0	0.0	46.2	188.2
495 Federal electric utilities	0.0	0.0	0.0	0.0
496 Other Federal Government enterprises	0.0	0.1	0.2	0.3
497 State and local government passenger t	8.3	1.5	4.6	14.4
498 State and local government electric uti	81.4	0.3	1.7	83.4
499 Other State and local government ente	24.9	5.2	11.3	41.4
500 Noncomparable imports	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2006 Petroleum Displacement No Refine MULTIPLIER:
Cleveland EV 2008 090908.iap

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
501 Scrap	0.0	0.0	0.0	0.0
502 Used and secondhand goods	0.0	0.0	0.0	0.0
503 State & Local Education	0.0	0.0	296.9	296.9
504 State & Local Non-Education	0.0	0.0	196.0	196.0
505 Federal Military	0.0	0.0	27.1	27.1
506 Federal Non-Military	0.0	0.0	36.7	36.7
507 Rest of the world adjustment to final	0.0	0.0	0.0	0.0
508 Inventory valuation adjustment	0.0	0.0	0.0	0.0
509 Owner-occupied dwellings	0.0	0.0	0.0	0.0
11,001 Federal Government NonDefense	0.0	0.0	0.0	0.0
11,003 Federal Government Investment	0.0	0.0	0.0	0.0
12,001 State/Local Govt NonEducation	0.0	0.0	0.0	0.0
12,003 State/Local Govt Investment	0.0	0.0	0.0	0.0
14,001 Capital	0.0	0.0	0.0	0.0
14,002 Inventory Additions/Deletions	0.0	0.0	0.0	0.0
25,001 Foreign Trade	0.0	0.0	0.0	0.0
28,001 Domestic Trade	0.0	0.0	0.0	0.0
	2,448.4	656.8	2,914.7	6,019.9

*Number of Jobs

Version:2.0.1025

Report IM020



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
1 Oilseed farming	1,811	335	1,309	3,455	1.00
2 Grain farming	4,485	3,797	3,030	11,311	1.00
3 Vegetable and melon farming	97,252	3,092	33,015	133,360	1.00
4 Tree nut farming	24	4	9	37	1.00
5 Fruit farming	32,810	2,095	11,085	45,989	1.00
6 Greenhouse and nursery production	393,888	87,530	207,403	688,821	1.00
7 Tobacco farming	0	0	0	0	1.00
8 Cotton farming	0	0	0	0	1.00
9 Sugarcane and sugar beet farming	0	0	0	0	1.00
10 All other crop farming	4,024	22,244	15,701	41,969	1.00
11 Cattle ranching and farming	10,927	416,742	154,066	581,734	1.00
12 Poultry and egg production	15,819	6,763	7,630	30,212	1.00
13 Animal production- except cattle and	65,412	34,464	34,180	134,056	1.00
14 Logging	0	5,023	18,426	23,449	1.00
15 Forest nurseries- forest products- and	0	0	0	0	1.00
16 Fishing	0	0	0	0	1.00
17 Hunting and trapping	23,522	251	7,934	31,707	1.00
18 Agriculture and forestry support activi	1,850	2,687	1,817	6,354	1.00
19 Oil and gas extraction	272,020	19,551,982	1,523,974	21,347,976	1.00
20 Coal mining	11	15,395	392	15,798	1.00
21 Iron ore mining	0	0	0	0	1.00
22 Copper- nickel- lead- and zinc mining	0	0	0	0	1.00
23 Gold- silver- and other metal ore mini	0	0	0	0	1.00
24 Stone mining and quarrying	0	196	732	927	1.00
25 Sand- gravel- clay- and refractory min	0	721	2,444	3,165	1.00
26 Other nonmetallic mineral mining	71	13,910	12,117	26,097	1.00
27 Drilling oil and gas wells	0	7,568	121,450	129,018	1.00
28 Support activities for oil and gas oper	0	95,435	43,157	138,592	1.00
29 Support activities for other mining	0	8	3,507	3,515	1.00
30 Power generation and supply	176,170,576	967,952	4,287,745	181,426,272	1.00
31 Natural gas distribution	2,339,279	330,082	1,085,008	3,754,369	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
32 Water- sewage and other systems	266,335	101,236	124,618	492,189	1.00
33 New residential 1-unit structures- all	0	0	12,487,599	12,487,599	1.00
34 New multifamily housing structures- a	0	0	1,478,696	1,478,696	1.00
35 New residential additions and alteratio	0	0	3,356,927	3,356,927	1.00
36 New farm housing units	0	0	0	0	1.00
37 Manufacturing and industrial building	0	0	1,373,673	1,373,673	1.00
38 Commercial and institutional building	0	0	8,394,223	8,394,223	1.00
39 Highway- street- bridge- and tunnel co	0	0	1,654,032	1,654,032	1.00
40 Water- sewer- and pipeline constructi	0	0	1,018,091	1,018,091	1.00
41 Other new construction	0	0	2,293,077	2,293,077	1.00
42 Maintenance and repair of farm and n	0	558,350	811,963	1,370,313	1.00
43 Maintenance and repair of nonresidenti	0	1,410,492	1,197,880	2,608,372	1.00
44 Maintenance and repair of highways- st	0	0	594,471	594,471	1.00
45 Other maintenance and repair construc	0	2,411,950	251,714	2,663,663	1.00
46 Dog and cat food manufacturing	15,645	7,992	7,573	31,211	1.00
47 Other animal food manufacturing	1,986	1,380	1,186	4,551	1.00
48 Flour milling	33,973	12,133	15,170	61,276	1.00
49 Rice milling	0	0	0	0	1.00
50 Malt manufacturing	0	0	0	0	1.00
51 Wet corn milling	0	0	0	0	1.00
52 Soybean processing	0	0	0	0	1.00
53 Other oilseed processing	0	0	0	0	1.00
54 Fats and oils refining and blending	15,513	7,767	7,966	31,245	1.00
55 Breakfast cereal manufacturing	0	0	0	0	1.00
56 Sugar manufacturing	12,092	5,120	5,946	23,159	1.00
57 Confectionery manufacturing from ca	0	0	0	0	1.00
58 Confectionery manufacturing from pu	31,710	2,257	11,182	45,150	1.00
59 Nonchocolate confectionery manufact	14,342	1,607	5,729	21,677	1.00
60 Frozen food manufacturing	81,528	20,278	33,509	135,315	1.00
61 Fruit and vegetable canning and dryin	35,201	8,540	14,978	58,719	1.00
62 Fluid milk manufacturing	1,176,850	382,897	596,042	2,155,788	1.00
63 Creamery butter manufacturing	0	0	0	0	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
64 Cheese manufacturing	719,603	483,173	394,978	1,597,754	1.00
65 Dry- condensed- and evaporated dairy	0	0	0	0	1.00
66 Ice cream and frozen dessert manufact	26,914	49,388	29,321	105,623	1.00
67 Animal- except poultry- slaughtering	16,365	3,403	7,075	26,843	1.00
68 Meat processed from carcasses	153,743	54,410	67,696	275,849	1.00
69 Rendering and meat byproduct proces	72	2,480	1,023	3,576	1.00
70 Poultry processing	172,377	37,420	66,460	276,258	1.00
71 Seafood product preparation and pack	0	0	0	0	1.00
72 Frozen cakes and other pastries manuf	99,588	25,095	39,673	164,356	1.00
73 Bread and bakery product- except fro	1,427,652	421,420	649,771	2,498,843	1.00
74 Cookie and cracker manufacturing	179,103	18,967	63,380	261,450	1.00
75 Mixes and dough made from purchased	447,198	58,409	163,036	668,643	1.00
76 Dry pasta manufacturing	0	0	0	0	1.00
77 Tortilla manufacturing	6,334	2,899	2,987	12,220	1.00
78 Roasted nuts and peanut butter manufa	49,474	3,870	17,941	71,285	1.00
79 Other snack food manufacturing	382,474	137,514	164,367	684,354	1.00
80 Coffee and tea manufacturing	8,169	170	2,835	11,175	1.00
81 Flavoring syrup and concentrate manu	4,031	38,583	15,789	58,403	1.00
82 Mayonnaise- dressing- and sauce manu	140,715	57,003	68,027	265,745	1.00
83 Spice and extract manufacturing	293,713	109,413	136,666	539,792	1.00
84 All other food manufacturing	397,330	42,927	138,170	578,428	1.00
85 Soft drink and ice manufacturing	206,766	46,410	79,904	333,080	1.00
86 Breweries	4,833	767	1,755	7,354	1.00
87 Wineries	13,095	3,210	5,151	21,456	1.00
88 Distilleries	14,597	5,298	6,349	26,244	1.00
89 Tobacco stemming and redrying	0	0	0	0	1.00
90 Cigarette manufacturing	0	0	0	0	1.00
91 Other tobacco product manufacturing	0	0	0	0	1.00
92 Fiber- yarn- and thread mills	14	28	16	58	1.00
93 Broadwoven fabric mills	886	211	413	1,509	1.00
94 Narrow fabric mills and schiffli embro	321	737	452	1,510	1.00
95 Nonwoven fabric mills	134	160	159	452	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
96 Knit fabric mills	0	0	0	0	1.00
97 Textile and fabric finishing mills	1,436	7,096	4,394	12,925	1.00
98 Fabric coating mills	620	1,361	3,734	5,715	1.00
99 Carpet and rug mills	0	0	0	0	1.00
100 Curtain and linen mills	126,398	8,467	47,390	182,255	1.00
101 Textile bag and canvas mills	8,888	540	3,756	13,184	1.00
102 Tire cord and tire fabric mills	3	6	5	14	1.00
103 Other miscellaneous textile product mi	3,906	585	1,806	6,298	1.00
104 Sheer hosiery mills	0	0	0	0	1.00
105 Other hosiery and sock mills	0	0	0	0	1.00
106 Other apparel knitting mills	0	0	0	0	1.00
107 Cut and sew apparel manufacturing	1,041,275	16,099	362,608	1,419,982	1.00
108 Accessories and other apparel manufa	2,838	79	1,046	3,964	1.00
109 Leather and hide tanning and finishing	177	290	263	730	1.00
110 Footwear manufacturing	59,047	110	18,871	78,028	1.00
111 Other leather product manufacturing	20,930	1,197	7,786	29,913	1.00
112 Sawmills	0	16,320	39,065	55,385	1.00
113 Wood preservation	0	2,971	7,836	10,807	1.00
114 Reconstituted wood product manufact	0	0	0	0	1.00
115 Veneer and plywood manufacturing	0	0	0	0	1.00
116 Engineered wood member and truss ma	0	28,338	69,243	97,580	1.00
117 Wood windows and door manufacturi	320	59,207	133,398	192,925	1.00
118 Cut stock- resawing lumber- and plani	0	0	0	0	1.00
119 Other millwork- including flooring	0	97,450	231,815	329,265	1.00
120 Wood container and pallet manufactur	31,876	-85,414	51,009	-2,529	1.00
121 Manufactured home- mobile home- ma	0	0	0	0	1.00
122 Prefabricated wood building manufact	0	16	39	54	1.00
123 Miscellaneous wood product manufact	18,727	6,122	16,663	41,512	1.00
124 Pulp mills	0	0	0	0	1.00
125 Paper and paperboard mills	21	16	20	58	1.00
126 Paperboard container manufacturing	3,768	15,443	12,172	31,383	1.00
127 Flexible packaging foil manufacturing	222	3,741	2,009	5,973	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

Industry	Direct*	Indirect*	Induced*	Total*	Deflator
128 Surface-coated paperboard manufactu	15	965	2,259	3,239	1.00
129 Coated and laminated paper and packa	57,163	77,642	92,852	227,657	1.00
130 Coated and uncoated paper bag manuf	146	156	243	545	1.00
131 Die-cut paper office supplies manufac	281	75	274	630	1.00
132 Envelope manufacturing	69	123	172	364	1.00
133 Stationery and related product manufa	608	129	505	1,243	1.00
134 Sanitary paper product manufacturing	3,508	1,196	1,585	6,289	1.00
135 All other converted paper product man	658	1,025	1,990	3,674	1.00
136 Manifold business forms printing	6,394	20,485	50,623	77,502	1.00
137 Books printing	5	771	423	1,199	1.00
138 Blankbook and looseleaf binder manuf	41,458	8,816	35,003	85,278	1.00
139 Commercial printing	58,108	89,828	291,325	439,262	1.00
140 Tradebinding and related work	1,239	5,519	10,920	17,678	1.00
141 Prepress services	718	9,428	11,798	21,945	1.00
142 Petroleum refineries	0	0	0	0	1.00
143 Asphalt paving mixture and block man	0	80,109	252,726	332,834	1.00
144 Asphalt shingle and coating materials	0	143,411	209,195	352,605	1.00
145 Petroleum lubricating oil and grease	309,607	41,328	174,924	525,859	1.00
146 All other petroleum and coal products	5,603	879	3,823	10,305	1.00
147 Petrochemical manufacturing	1,091,488	1,741,409	1,426,439	4,259,336	1.00
148 Industrial gas manufacturing	22,749	264,396	129,525	416,670	1.00
149 Synthetic dye and pigment manufactur	352	78,601	73,471	152,424	1.00
150 Other basic inorganic chemical manufa	590	101,681	88,311	190,582	1.00
151 Other basic organic chemical manufac	18,213	374,313	224,185	616,711	1.00
152 Plastics material and resin manufactur	7,372	86,267	53,216	146,855	1.00
153 Synthetic rubber manufacturing	2,470	33,620	21,331	57,421	1.00
154 Cellulosic organic fiber manufacturing	0	-7	9	3	1.00
155 Noncellulosic organic fiber manufactu	51	176	149	375	1.00
156 Nitrogenous fertilizer manufacturing	2,267	34,579	33,751	70,597	1.00
157 Phosphatic fertilizer manufacturing	0	0	0	0	1.00
158 Fertilizer- mixing only- manufacturing	5	41	52	99	1.00
159 Pesticide and other agricultural chemi	1,305	1,543	1,357	4,205	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
160 Pharmaceutical and medicine manufac	6,092,373	1,926,003	2,672,118	10,690,493	1.00
161 Paint and coating manufacturing	919	4,023	10,095	15,037	1.00
162 Adhesive manufacturing	60,955	98,450	134,834	294,239	1.00
163 Soap and other detergent manufacturin	1,116,264	162,750	492,054	1,771,069	1.00
164 Polish and other sanitation good manu	825,275	141,853	387,897	1,355,024	1.00
165 Surface active agent manufacturing	0	0	0	0	1.00
166 Toilet preparation manufacturing	1,598,114	207,212	594,062	2,399,388	1.00
167 Printing ink manufacturing	1	18,268	27,691	45,959	1.00
168 Explosives manufacturing	0	0	0	0	1.00
169 Custom compounding of purchased res	70	98,535	88,292	186,897	1.00
170 Photographic film and chemical manuf	53,600	102,748	193,391	349,738	1.00
171 Other miscellaneous chemical product	40,975	252,636	171,071	464,681	1.00
172 Plastics packaging materials- film and	183,414	185,045	289,013	657,472	1.00
173 Plastics pipe- fittings- and profile sha	10,667	370,491	305,770	686,927	1.00
174 Laminated plastics plate- sheet- and s	3,790	49,672	48,811	102,273	1.00
175 Plastics bottle manufacturing	843	231,758	90,754	323,355	1.00
176 Resilient floor covering manufacturing	1,953	12,554	25,865	40,372	1.00
177 Plastics plumbing fixtures and all othe	416,111	834,921	987,900	2,238,933	1.00
178 Foam product manufacturing	86,525	444,364	297,836	828,725	1.00
179 Tire manufacturing	178	25	314	517	1.00
180 Rubber and plastics hose and belting	1,951	5,691	6,694	14,336	1.00
181 Other rubber product manufacturing	9,530	13,015	18,791	41,335	1.00
182 Vitreous china plumbing fixture manuf	0	0	0	0	1.00
183 Vitreous china and earthenware articl	27,399	1,408	10,298	39,106	1.00
184 Porcelain electrical supply manufactur	0	0	0	0	1.00
185 Brick and structural clay tile manufac	0	0	0	0	1.00
186 Ceramic wall and floor tile manufactu	0	136	381	517	1.00
187 Nonclay refractory manufacturing	0	30	65	95	1.00
188 Clay refractory and other structural c	0	1	13	14	1.00
189 Glass container manufacturing	0	0	0	0	1.00
190 Glass and glass products- except glass	92,837	189,547	161,684	444,068	1.00
191 Cement manufacturing	0	0	0	0	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
192 Ready-mix concrete manufacturing	0	204	671	874	1.00
193 Concrete block and brick manufacturi	0	101	507	608	1.00
194 Concrete pipe manufacturing	0	17	37	54	1.00
195 Other concrete product manufacturing	693	154	1,890	2,738	1.00
196 Lime manufacturing	0	11	25	37	1.00
197 Gypsum product manufacturing	1	101	219	321	1.00
198 Abrasive product manufacturing	886	709	988	2,583	1.00
199 Cut stone and stone product manufact	23,591	1,457	60,355	85,403	1.00
200 Ground or treated minerals and earths	0	0	0	1	1.00
201 Mineral wool manufacturing	582	3,071	2,325	5,978	1.00
202 Miscellaneous nonmetallic mineral pr	6,430	593	3,060	10,083	1.00
203 Iron and steel mills	1,661	39,122	85,701	126,484	1.00
204 Ferroalloy and related product manufa	0	0	0	0	1.00
205 Iron- steel pipe and tube from purchas	103	5,457	11,777	17,337	1.00
206 Rolled steel shape manufacturing	454	12,907	28,071	41,432	1.00
207 Steel wire drawing	3,744	4,296	14,580	22,620	1.00
208 Alumina refining	0	0	0	0	1.00
209 Primary aluminum production	0	4	11	15	1.00
210 Secondary smelting and alloying of a	0	100	311	411	1.00
211 Aluminum sheet- plate- and foil manuf	6	1,239	1,983	3,228	1.00
212 Aluminum extruded product manufact	0	10	17	28	1.00
213 Other aluminum rolling and drawing	16	923	1,110	2,049	1.00
214 Primary smelting and refining of copp	0	0	0	0	1.00
215 Primary nonferrous metal- except cop	0	0	0	0	1.00
216 Copper rolling- drawing- and extrudin	21	1,035	2,486	3,542	1.00
217 Copper wire- except mechanical- draw	3,893	46,297	82,088	132,278	1.00
218 Secondary processing of copper	0	313	828	1,141	1.00
219 Nonferrous metal- except copper and	1,025	15,413	12,496	28,935	1.00
220 Secondary processing of other nonferr	24	22,366	19,294	41,683	1.00
221 Ferrous metal foundaries	1	101	383	485	1.00
222 Aluminum foundries	51	2,886	8,512	11,449	1.00
223 Nonferrous foundries- except alumin	19	1,058	3,143	4,220	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
224 Iron and steel forging	16	3,716	29,389	33,121	1.00
225 Nonferrous forging	0	1,143	6,313	7,456	1.00
226 Custom roll forming	5	1,482	3,522	5,008	1.00
227 All other forging and stamping	4,245	12,308	43,378	59,931	1.00
228 Cutlery and flatware- except precious	1,808	161	807	2,777	1.00
229 Hand and edge tool manufacturing	57,048	15,073	60,053	132,175	1.00
230 Saw blade and handsaw manufacturin	5,943	2,967	26,313	35,222	1.00
231 Kitchen utensil- pot- and pan manufac	175,303	21,534	67,328	264,165	1.00
232 Prefabricated metal buildings and co	157	865	3,298	4,319	1.00
233 Fabricated structural metal manufactu	0	1,633	5,416	7,049	1.00
234 Plate work manufacturing	0	7,241	8,804	16,044	1.00
235 Metal window and door manufacturing	479	1,965	3,852	6,295	1.00
236 Sheet metal work manufacturing	49	2,287	6,015	8,351	1.00
237 Ornamental and architectural metal w	10	2,926	5,973	8,909	1.00
238 Power boiler and heat exchanger manu	0	1,723	45,524	47,247	1.00
239 Metal tank- heavy gauge- manufacturi	0	188	1,680	1,867	1.00
240 Metal can- box- and other container m	3,605	22,956	22,743	49,304	1.00
241 Hardware manufacturing	882	1,607	3,813	6,302	1.00
242 Spring and wire product manufacturin	4,848	26,154	41,802	72,804	1.00
243 Machine shops	211	183,099	182,075	365,385	1.00
244 Turned product and screw- nut- and b	8,077	58,244	110,024	176,345	1.00
245 Metal heat treating	0	18,858	16,531	35,389	1.00
246 Metal coating and nonprecious engrav	104	28,173	22,846	51,123	1.00
247 Electroplating- anodizing- and colorin	0	62,902	60,210	123,112	1.00
248 Metal valve manufacturing	0	32,699	151,567	184,266	1.00
249 Ball and roller bearing manufacturing	0	8,983	17,943	26,926	1.00
250 Small arms manufacturing	0	0	0	0	1.00
251 Other ordnance and accessories manuf	0	0	0	0	1.00
252 Fabricated pipe and pipe fitting manuf	0	10,054	40,486	50,540	1.00
253 Industrial pattern manufacturing	0	373	7,230	7,603	1.00
254 Enameled iron and metal sanitary war	0	0	0	0	1.00
255 Miscellaneous fabricated metal produ	34	634	1,141	1,809	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
256 Ammunition manufacturing	30	1	16	47	1.00
257 Farm machinery and equipment manufa	0	13,708	57,426	71,134	1.00
258 Lawn and garden equipment manufactu	89,079	36,097	763,622	888,799	1.00
259 Construction machinery manufacturin	640	8,263	70,544	79,448	1.00
260 Mining machinery and equipment manu	0	1,220	66,146	67,366	1.00
261 Oil and gas field machinery and equi	0	657	4,142	4,798	1.00
262 Sawmill and woodworking machinery	12,002	1,648	19,560	33,210	1.00
263 Plastics and rubber industry machiner	242	4,563	105,139	109,944	1.00
264 Paper industry machinery manufacturi	0	325	17,541	17,866	1.00
265 Textile machinery manufacturing	0	113	14,317	14,431	1.00
266 Printing machinery and equipment man	2	9	41,104	41,115	1.00
267 Food product machinery manufacturin	24	3,300	44,904	48,227	1.00
268 Semiconductor machinery manufacturi	0	0	0	0	1.00
269 All other industrial machinery manufa	13,089	9,659	372,920	395,668	1.00
270 Office machinery manufacturing	0	0	0	0	1.00
271 Optical instrument and lens manufactu	8,535	2,468	12,897	23,900	1.00
272 Photographic and photocopying equip	5,524	339	3,211	9,074	1.00
273 Other commercial and service industr	12	7,569	405,012	412,592	1.00
274 Automatic vending- commercial laund	25	4,752	4,521	9,299	1.00
275 Air purification equipment manufactur	13	58	406	477	1.00
276 Industrial and commercial fan and bl	9	60	178	248	1.00
277 Heating equipment- except warm air f	0	0	1	1	1.00
278 AC- refrigeration- and forced air heati	0	0	0	0	1.00
279 Industrial mold manufacturing	773	2,568	23,550	26,892	1.00
280 Metal cutting machine tool manufactur	839	612	136,068	137,519	1.00
281 Metal forming machine tool manufactu	13	77	2,684	2,775	1.00
282 Special tool- die- jig- and fixture man	264	8,336	694,157	702,758	1.00
283 Cutting tool and machine tool accesso	11	10,251	27,874	38,136	1.00
284 Rolling mill and other metalworking m	28	774	242,238	243,040	1.00
285 Turbine and turbine generator set unit	0	0	0	0	1.00
286 Other engine equipment manufacturin	18,904	51,818	88,674	159,397	1.00
287 Speed changers and mechanical power	677	24,612	107,313	132,602	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
288 Pump and pumping equipment manufac	0	427	1,825	2,252	1.00
289 Air and gas compressor manufacturin	0	8,111	4,559	12,670	1.00
290 Measuring and dispensing pump manuf	0	2	10	13	1.00
291 Elevator and moving stairway manufac	0	1,370	19,830	21,201	1.00
292 Conveyor and conveying equipment m	42	14,842	286,858	301,742	1.00
293 Overhead cranes- hoists- and monorai	0	3,192	115,776	118,968	1.00
294 Industrial truck- trailer- and stacker m	185	-1,469	283,305	282,021	1.00
295 Power-driven handtool manufacturing	55,916	4,199	152,227	212,342	1.00
296 Welding and soldering equipment man	8,202	26,490	2,431,771	2,466,463	1.00
297 Packaging machinery manufacturing	0	3,758	200,381	204,139	1.00
298 Industrial process furnace and oven m	135	456	1,317	1,908	1.00
299 Fluid power cylinder and actuator man	1	203	1,146	1,351	1.00
300 Fluid power pump and motor manufact	35	226	2,271	2,532	1.00
301 Scales- balances- and miscellaneous g	5,021	21,754	156,495	183,269	1.00
302 Electronic computer manufacturing	1,109,312	79,487	583,649	1,772,448	1.00
303 Computer storage device manufacturi	39,782	76,326	83,611	199,720	1.00
304 Computer terminal manufacturing	2,897	22,284	29,386	54,566	1.00
305 Other computer peripheral equipment	45,606	7,333	33,272	86,211	1.00
306 Telephone apparatus manufacturing	53,960	17,809	1,041,829	1,113,599	1.00
307 Broadcast and wireless communicatio	45,077	17,809	281,213	344,098	1.00
308 Other communications equipment manu	171	9,665	67,469	77,305	1.00
309 Audio and video equipment manufactu	29,644	669	10,148	40,461	1.00
310 Electron tube manufacturing	135	3,786	7,646	11,566	1.00
311 Semiconductors and related device ma	38	10,561	24,442	35,041	1.00
312 All other electronic component manufa	58,775	125,521	257,465	441,761	1.00
313 Electromedical apparatus manufacturi	50,241	283,799	486,049	820,088	1.00
314 Search- detection- and navigation inst	50	22	641	714	1.00
315 Automatic environmental control manu	0	5,142	14,100	19,242	1.00
316 Industrial process variable instrument	1,217	23,368	219,488	244,072	1.00
317 Totalizing fluid meters and counting d	0	2,051	2,081	4,132	1.00
318 Electricity and signal testing instrumen	1,889	9,529	136,108	147,526	1.00
319 Analytical laboratory instrument manu	652	742	1,089	2,482	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
320 Irradiation apparatus manufacturing	688	24,556	225,358	250,602	1.00
321 Watch- clock- and other measuring and	28,956	2,510	33,154	64,619	1.00
322 Software reproducing	0	19,468	38,931	58,398	1.00
323 Audio and video media reproduction	16	1,549	1,618	3,184	1.00
324 Magnetic and optical recording media	548	681	721	1,949	1.00
325 Electric lamp bulb and part manufactu	43	21	38	103	1.00
326 Lighting fixture manufacturing	137	65	233	435	1.00
327 Electric housewares and household fa	7,544	260	2,785	10,588	1.00
328 Household vacuum cleaner manufactu	248,535	2,213	172,716	423,464	1.00
329 Household cooking appliance manufac	0	0	0	0	1.00
330 Household refrigerator and home free	0	0	0	0	1.00
331 Household laundry equipment manufac	40	0	13	53	1.00
332 Other major household appliance manu	0	0	0	0	1.00
333 Electric power and specialty transfor	145	2,375	4,548	7,069	1.00
334 Motor and generator manufacturing	1,906	10,568	29,576	42,050	1.00
335 Switchgear and switchboard apparatus	3,371	50,420	128,676	182,467	1.00
336 Relay and industrial control manufactu	475	23,672	89,836	113,983	1.00
337 Storage battery manufacturing	11,255	4,050	7,196	22,501	1.00
338 Primary battery manufacturing	934	17	311	1,261	1.00
339 Fiber optic cable manufacturing	465	8,580	9,035	18,080	1.00
340 Other communication and energy wire	170	43,379	61,762	105,311	1.00
341 Wiring device manufacturing	340	2,994	5,853	9,187	1.00
342 Carbon and graphite product manufact	1,070	3,998	7,603	12,671	1.00
343 Miscellaneous electrical equipment m	20,410	6,202	83,414	110,026	1.00
344 Automobile and light truck manufactu	5,577,735	6,028	4,437,207	10,020,970	1.00
345 Heavy duty truck manufacturing	0	0	0	0	1.00
346 Motor vehicle body manufacturing	3,410	16,022	28,659	48,091	1.00
347 Truck trailer manufacturing	10	1,427	189,273	190,709	1.00
348 Motor home manufacturing	0	0	0	0	1.00
349 Travel trailer and camper manufacturi	54,548	993	22,134	77,674	1.00
350 Motor vehicle parts manufacturing	418,458	735,173	833,129	1,986,759	1.00
351 Aircraft manufacturing	6,733	1,760	12,057	20,549	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
352 Aircraft engine and engine parts manu	591	92,210	230,817	323,617	1.00
353 Other aircraft parts and equipment	2,707	2,152	72,559	77,417	1.00
354 Guided missile and space vehicle man	0	0	0	0	1.00
355 Propulsion units and parts for space v	0	0	0	0	1.00
356 Railroad rolling stock manufacturing	85	-284	880	681	1.00
357 Ship building and repairing	0	-160	93	-67	1.00
358 Boat building	6,115	-13	2,456	8,558	1.00
359 Motorcycle- bicycle- and parts manufa	61,836	7,635	26,117	95,589	1.00
360 Military armored vehicles and tank pa	3,198	4	2,777	5,979	1.00
361 All other transportation equipment ma	2,285	226	1,125	3,636	1.00
362 Wood kitchen cabinet and countertop	82,825	238,834	647,844	969,503	1.00
363 Upholstered household furniture manu	40,707	28	14,202	54,936	1.00
364 Nonupholstered wood household furni	316,677	2,873	118,915	438,464	1.00
365 Metal household furniture manufactur	19,625	89	7,581	27,296	1.00
366 Institutional furniture manufacturing	3,023	721	11,660	15,403	1.00
367 Other household and institutional furni	5,087	597	2,560	8,244	1.00
368 Wood office furniture manufacturing	4,416	62	52,913	57,390	1.00
369 Custom architectural woodwork and m	0	3,766	85,704	89,470	1.00
370 Office furniture- except wood- manufa	117	30	18,781	18,927	1.00
371 Showcases- partitions- shelving- and l	695	10,476	363,696	374,866	1.00
372 Mattress manufacturing	455,039	247	245,170	700,456	1.00
373 Blind and shade manufacturing	63,605	147	22,690	86,441	1.00
374 Laboratory apparatus and furniture ma	4,322	9,188	300,865	314,376	1.00
375 Surgical and medical instrument manu	33,592	539,282	603,989	1,176,863	1.00
376 Surgical appliance and supplies manuf	387,981	578,856	746,598	1,713,435	1.00
377 Dental equipment and supplies manufa	1,888	152,739	165,588	320,214	1.00
378 Ophthalmic goods manufacturing	173,214	2,442	56,147	231,803	1.00
379 Dental laboratories	0	338,484	110,831	449,315	1.00
380 Jewelry and silverware manufacturing	85,390	1,745	31,342	118,477	1.00
381 Sporting and athletic goods manufactu	7,950	543	3,402	11,895	1.00
382 Doll- toy- and game manufacturing	1,227,091	54,516	437,719	1,719,325	1.00
383 Office supplies- except paper- manufa	10,465	1,276	5,185	16,926	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
384 Sign manufacturing	525	-2,819	73,049	70,755	1.00
385 Gasket- packing- and sealing device	819	2,488	4,760	8,067	1.00
386 Musical instrument manufacturing	144,604	8,356	83,367	236,327	1.00
387 Broom- brush- and mop manufacturing	16,106	6,182	14,695	36,984	1.00
388 Burial casket manufacturing	0	311	90	401	1.00
389 Buttons- pins- and all other miscella	17,437	8,701	15,727	41,865	1.00
390 Wholesale trade	-29,787,386	580,108	1,842,785	-27,364,492	1.00
391 Air transportation	689,126	127,824	370,106	1,187,056	1.00
392 Rail transportation	-3,931,774	1,620,147	416,974	-1,894,653	1.00
393 Water transportation	-2,756,479	196,924	417,503	-2,142,052	1.00
394 Truck transportation	-3,829,296	1,424,247	3,807,021	1,401,972	1.00
395 Transit and ground passenger transpor	221,658	40,728	128,002	390,388	1.00
396 Pipeline transportation	-1,226,103	997,724	81,988	-146,391	1.00
397 Scenic and sightseeing transportation	133,639	-341,694	412,095	204,040	1.00
398 Postal service	470,875	790,236	852,321	2,113,432	1.00
399 Couriers and messengers	0	83,411	484,410	567,821	1.00
400 Warehousing and storage	39,971	-158,493	380,699	262,177	1.00
401 Motor vehicle and parts dealers	14,373,861	203,421	5,327,041	19,904,322	1.00
402 Furniture and home furnishings stores	3,293,121	57,012	1,236,527	4,586,659	1.00
403 Electronics and appliance stores	2,012,543	40,183	817,165	2,869,891	1.00
404 Building material and garden supply s	7,090,720	120,157	2,672,775	9,883,650	1.00
405 Food and beverage stores	11,429,621	163,143	4,265,652	15,858,416	1.00
406 Health and personal care stores	5,095,453	89,070	1,927,806	7,112,328	1.00
407 Gasoline stations	-186,628,160	73,072	1,645,977	-184,909,104	1.00
408 Clothing and clothing accessories stor	6,307,483	83,360	2,303,044	8,693,887	1.00
409 Sporting goods- hobby- book and musi	2,434,276	36,986	932,754	3,404,017	1.00
410 General merchandise stores	9,320,521	132,900	3,423,958	12,877,379	1.00
411 Miscellaneous store retailers	3,607,991	51,424	1,354,235	5,013,649	1.00
412 Nonstore retailers	7,260,763	120,996	2,703,758	10,085,516	1.00
413 Newspaper publishers	256,153	-18,086	424,361	662,429	1.00
414 Periodical publishers	246,950	43,152	250,843	540,945	1.00
415 Book publishers	343,716	77,784	203,764	625,264	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
416 Database- directory- and other publish	202,212	53,925	398,713	654,850	1.00
417 Software publishers	353,501	19,219	246,755	619,475	1.00
418 Motion picture and video industries	558,435	456,870	415,321	1,430,626	1.00
419 Sound recording industries	217,929	32,388	83,289	333,605	1.00
420 Radio and television broadcasting	169,541	56,986	355,248	581,775	1.00
421 Cable networks and program distribut	194,694	6,627	71,411	272,733	1.00
422 Telecommunications	6,212,755	1,982,859	4,160,568	12,356,181	1.00
423 Information services	138,691	73,521	133,970	346,182	1.00
424 Data processing services	4,910	99,588	165,162	269,660	1.00
425 Nondepository credit intermediation an	1,926,236	1,197,762	2,006,277	5,130,276	1.00
426 Securities- commodity contracts- inve	3,785,524	4,490,333	3,293,888	11,569,744	1.00
427 Insurance carriers	11,418,636	2,719,182	5,206,068	19,343,886	1.00
428 Insurance agencies- brokerages- and r	0	3,101,717	1,141,590	4,243,307	1.00
429 Funds- trusts- and other financial vehi	3,509,625	78,317	1,265,311	4,853,253	1.00
430 Monetary authorities and depository c	13,104,654	1,870,099	5,574,978	20,549,730	1.00
431 Real estate	16,323,595	9,755,405	13,929,856	40,008,856	1.00
432 Automotive equipment rental and leas	1,354,661	209,319	699,405	2,263,385	1.00
433 Video tape and disc rental	409,181	339	138,713	548,233	1.00
434 Machinery and equipment rental and l	8,618	274,154	430,654	713,426	1.00
435 General and consumer goods rental ex	207,273	41,999	174,730	424,002	1.00
436 Lessors of nonfinancial intangible asse	0	1,256,869	465,979	1,722,848	1.00
437 Legal services	4,179,458	3,606,066	3,202,354	10,987,877	1.00
438 Accounting and bookkeeping services	285,927	1,377,144	1,620,850	3,283,921	1.00
439 Architectural and engineering services	2,071	1,716,200	2,848,175	4,566,446	1.00
440 Specialized design services	37,823	163,366	247,010	448,199	1.00
441 Custom computer programming servic	7,856	55,904	2,355,300	2,419,060	1.00
442 Computer systems design services	39,740	326,112	654,536	1,020,388	1.00
443 Other computer related services- includ	31,720	218,537	354,582	604,839	1.00
444 Management consulting services	45,519	1,213,620	1,370,078	2,629,217	1.00
445 Environmental and other technical cons	60	405,315	384,199	789,574	1.00
446 Scientific research and development s	671,440	642,549	948,224	2,262,212	1.00
447 Advertising and related services	7,544	-49,544	802,598	760,597	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

Industry	Direct*	Indirect*	Induced*	Total*	Deflator
448 Photographic services	358,029	53,154	155,175	566,358	1.00
449 Veterinary services	1,860,640	89,236	663,210	2,613,087	1.00
450 All other miscellaneous professional a	0	1,262,365	817,295	2,079,660	1.00
451 Management of companies and enterpr	0	-1,014,501	2,681,777	1,667,276	1.00
452 Office administrative services	1,370	1,115,882	943,496	2,060,747	1.00
453 Facilities support services	17	41,577	132,302	173,896	1.00
454 Employment services	49,868	1,585,389	1,342,476	2,977,733	1.00
455 Business support services	224,698	706,567	624,353	1,555,619	1.00
456 Travel arrangement and reservation se	551,338	130,517	305,115	986,970	1.00
457 Investigation and security services	47,632	308,552	647,059	1,003,242	1.00
458 Services to buildings and dwellings	530,127	1,571,732	1,426,002	3,527,861	1.00
459 Other support services	31,876	209,843	370,000	611,719	1.00
460 Waste management and remediation se	176,619	558,270	573,404	1,308,293	1.00
461 Elementary and secondary schools	2,463,208	0	919,691	3,382,899	1.00
462 Colleges- universities- and junior coll	5,829,869	208,891	2,134,285	8,173,045	1.00
463 Other educational services	2,517,754	208,785	976,931	3,703,470	1.00
464 Home health care services	4,509,598	0	1,462,914	5,972,512	1.00
465 Offices of physicians- dentists- and ot	33,640,856	0	10,725,757	44,366,612	1.00
466 Other ambulatory health care services	9,043,594	636,934	3,227,284	12,907,812	1.00
467 Hospitals	39,129,608	0	12,535,702	51,665,312	1.00
468 Nursing and residential care facilities	10,107,682	0	3,270,463	13,378,144	1.00
469 Child day care services	3,733,573	0	1,294,732	5,028,305	1.00
470 Social assistance- except child day ca	5,507,473	18	1,900,515	7,408,005	1.00
471 Performing arts companies	436,156	233,050	234,885	904,092	1.00
472 Spectator sports	853,830	228,833	449,499	1,532,162	1.00
473 Independent artists- writers- and perf	2,015	87,865	49,519	139,399	1.00
474 Promoters of performing arts and spor	491,368	130,535	250,419	872,321	1.00
475 Museums- historical sites- zoos- and	594,423	0	197,095	791,518	1.00
476 Fitness and recreational sports centers	1,066,646	36,915	386,079	1,489,640	1.00
477 Bowling centers	269,509	19,120	101,699	390,329	1.00
478 Other amusement- gambling- and recrea	3,973,977	31,135	1,369,447	5,374,558	1.00
479 Hotels and motels- including casino ho	1,909,645	494,076	1,164,660	3,568,381	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

Industry	Direct*	Indirect*	Induced*	Total*	Deflator
480 Other accommodations	317,802	2,637	112,343	432,782	1.00
481 Food services and drinking places	27,610,668	1,707,660	10,115,320	39,433,648	1.00
482 Car washes	606,489	15,979	234,135	856,604	1.00
483 Automotive repair and maintenance- e	4,924,609	235,911	2,042,291	7,202,811	1.00
484 Electronic equipment repair and main	84,959	52,342	397,482	534,782	1.00
485 Commercial machinery repair and mai	0	163,853	301,372	465,225	1.00
486 Household goods repair and maintena	557,232	109,547	354,503	1,021,282	1.00
487 Personal care services	3,487,577	108,728	1,152,433	4,748,737	1.00
488 Death care services	1,077,191	0	312,538	1,389,729	1.00
489 Drycleaning and laundry services	945,051	276,224	521,577	1,742,852	1.00
490 Other personal services	3,811,192	57,954	1,400,921	5,270,067	1.00
491 Religious organizations	1,697,755	0	560,568	2,258,323	1.00
492 Grantmaking and giving and social ad	1,972,194	0	681,437	2,653,631	1.00
493 Civic- social- professional and similar	2,635,383	1,022,042	1,385,327	5,042,753	1.00
494 Private households	1,225,981	0	417,432	1,643,413	1.00
495 Federal electric utilities	0	0	0	0	1.00
496 Other Federal Government enterprises	-904	2,326	3,797	5,218	1.00
497 State and local government passenger t	587,229	107,898	339,111	1,034,238	1.00
498 State and local government electric uti	29,853,722	145,864	671,799	30,671,384	1.00
499 Other State and local government ente	5,559,140	1,228,416	2,655,017	9,442,573	1.00
500 Noncomparable imports	0	0	0	0	1.00
501 Scrap	0	0	0	0	1.00
502 Used and secondhand goods	0	0	0	0	1.00
503 State & Local Education	0	0	16,216,966	16,216,966	1.00
504 State & Local Non-Education	0	0	13,152,272	13,152,272	1.00
505 Federal Military	0	0	1,684,418	1,684,418	1.00
506 Federal Non-Military	0	0	7,321,540	7,321,540	1.00
507 Rest of the world adjustment to final	0	0	0	0	1.00
508 Inventory valuation adjustment	0	0	0	0	1.00
509 Owner-occupied dwellings	78,681,584	0	26,633,382	105,314,968	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
11001 Federal Government NonDefense	11,505	0	0	11,505	1.00
11003 Federal Government Investment	11,271	0	0	11,271	1.00
12001 State/Local Govt NonEducation	15,573,097	0	0	15,573,097	1.00
12003 State/Local Govt Investment	172,865	0	0	172,865	1.00
14001 Capital	1,342,985	0	0	1,342,985	1.00
14002 Inventory Additions/Deletions	34,160	0	0	34,160	1.00
25001 Foreign Trade	46,679,752	0	0	46,679,752	1.00
28001 Domestic Trade	-84,421,848	0	0	-84,421,848	1.00
Total	397,825,505	99,790,034	315,099,690	812,715,234	

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2006 Petroleum Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
1 Oilseed farming	0.0	0.0	0.0	0.0
2 Grain farming	0.1	0.1	0.1	0.2
3 Vegetable and melon farming	0.8	0.0	0.3	1.2
4 Tree nut farming	0.0	0.0	0.0	0.0
5 Fruit farming	0.5	0.0	0.2	0.7
6 Greenhouse and nursery production	5.4	1.2	2.8	9.4
7 Tobacco farming	0.0	0.0	0.0	0.0
8 Cotton farming	0.0	0.0	0.0	0.0
9 Sugarcane and sugar beet farming	0.0	0.0	0.0	0.0
10 All other crop farming	0.0	0.1	0.1	0.3
11 Cattle ranching and farming	0.1	4.4	1.6	6.1
12 Poultry and egg production	0.1	0.0	0.0	0.1
13 Animal production- except cattle and	1.9	1.0	1.0	3.9
14 Logging	0.0	0.0	0.1	0.1
15 Forest nurseries- forest products- and	0.0	0.0	0.0	0.0
16 Fishing	0.0	0.0	0.0	0.0
17 Hunting and trapping	0.2	0.0	0.1	0.2
18 Agriculture and forestry support activi	0.1	0.1	0.1	0.3
19 Oil and gas extraction	0.8	57.5	4.5	62.8
20 Coal mining	0.0	0.0	0.0	0.0
21 Iron ore mining	0.0	0.0	0.0	0.0
22 Copper- nickel- lead- and zinc mining	0.0	0.0	0.0	0.0
23 Gold- silver- and other metal ore mini	0.0	0.0	0.0	0.0
24 Stone mining and quarrying	0.0	0.0	0.0	0.0
25 Sand- gravel- clay- and refractory min	0.0	0.0	0.0	0.0
26 Other nonmetallic mineral mining	0.0	0.1	0.1	0.1
27 Drilling oil and gas wells	0.0	0.0	0.2	0.2
28 Support activities for oil and gas oper	0.0	0.6	0.3	0.8
29 Support activities for other mining	0.0	0.0	0.0	0.0
30 Power generation and supply	344.1	1.9	8.4	354.4
31 Natural gas distribution	3.4	0.5	1.6	5.5
32 Water- sewage and other systems	1.9	0.7	0.9	3.5
33 New residential 1-unit structures- all	0.0	0.0	82.7	82.7
34 New multifamily housing structures- a	0.0	0.0	12.9	12.9
35 New residential additions and alteratio	0.0	0.0	18.5	18.5
36 New farm housing units	0.0	0.0	0.0	0.0
37 Manufacturing and industrial building	0.0	0.0	15.3	15.3
38 Commercial and institutional building	0.0	0.0	85.2	85.2
39 Highway- street- bridge- and tunnel co	0.0	0.0	15.1	15.1
40 Water- sewer- and pipeline constructi	0.0	0.0	8.4	8.4
41 Other new construction	0.0	0.0	24.4	24.4
42 Maintenance and repair of farm and n	0.0	4.0	5.8	9.8
43 Maintenance and repair of nonresidenti	0.0	11.6	9.8	21.4
44 Maintenance and repair of highways- st	0.0	0.0	7.0	7.0
45 Other maintenance and repair construc	0.0	35.8	3.7	39.5
46 Dog and cat food manufacturing	0.0	0.0	0.0	0.0
47 Other animal food manufacturing	0.0	0.0	0.0	0.0
48 Flour milling	0.0	0.0	0.0	0.1
49 Rice milling	0.0	0.0	0.0	0.0
50 Malt manufacturing	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2006 Petroleum Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
51 Wet corn milling	0.0	0.0	0.0	0.0
52 Soybean processing	0.0	0.0	0.0	0.0
53 Other oilseed processing	0.0	0.0	0.0	0.0
54 Fats and oils refining and blending	0.0	0.0	0.0	0.0
55 Breakfast cereal manufacturing	0.0	0.0	0.0	0.0
56 Sugar manufacturing	0.0	0.0	0.0	0.0
57 Confectionery manufacturing from ca	0.0	0.0	0.0	0.0
58 Confectionery manufacturing from pu	0.1	0.0	0.0	0.1
59 Nonchocolate confectionery manufact	0.0	0.0	0.0	0.1
60 Frozen food manufacturing	0.2	0.1	0.1	0.4
61 Fruit and vegetable canning and dryin	0.1	0.0	0.0	0.1
62 Fluid milk manufacturing	2.0	0.6	1.0	3.7
63 Creamery butter manufacturing	0.0	0.0	0.0	0.0
64 Cheese manufacturing	1.0	0.6	0.5	2.1
65 Dry- condensed- and evaporated dairy	0.0	0.0	0.0	0.0
66 Ice cream and frozen dessert manufact	0.1	0.1	0.1	0.2
67 Animal- except poultry- slaughtering	0.0	0.0	0.0	0.1
68 Meat processed from carcasses	0.4	0.1	0.2	0.6
69 Rendering and meat byproduct proces	0.0	0.0	0.0	0.0
70 Poultry processing	0.8	0.2	0.3	1.3
71 Seafood product preparation and pack	0.0	0.0	0.0	0.0
72 Frozen cakes and other pastries manuf	0.6	0.1	0.2	0.9
73 Bread and bakery product- except fro	9.8	2.9	4.5	17.1
74 Cookie and cracker manufacturing	0.5	0.0	0.2	0.7
75 Mixes and dough made from purchased	1.2	0.2	0.4	1.8
76 Dry pasta manufacturing	0.0	0.0	0.0	0.0
77 Tortilla manufacturing	0.0	0.0	0.0	0.1
78 Roasted nuts and peanut butter manufa	0.1	0.0	0.0	0.1
79 Other snack food manufacturing	0.8	0.3	0.3	1.4
80 Coffee and tea manufacturing	0.0	0.0	0.0	0.0
81 Flavoring syrup and concentrate manu	0.0	0.1	0.0	0.1
82 Mayonnaise- dressing- and sauce manu	0.4	0.1	0.2	0.7
83 Spice and extract manufacturing	0.6	0.2	0.3	1.1
84 All other food manufacturing	1.5	0.2	0.5	2.2
85 Soft drink and ice manufacturing	0.3	0.1	0.1	0.5
86 Breweries	0.0	0.0	0.0	0.0
87 Wineries	0.0	0.0	0.0	0.1
88 Distilleries	0.0	0.0	0.0	0.0
89 Tobacco stemming and redrying	0.0	0.0	0.0	0.0
90 Cigarette manufacturing	0.0	0.0	0.0	0.0
91 Other tobacco product manufacturing	0.0	0.0	0.0	0.0
92 Fiber- yarn- and thread mills	0.0	0.0	0.0	0.0
93 Broadwoven fabric mills	0.0	0.0	0.0	0.0
94 Narrow fabric mills and schiffli embro	0.0	0.0	0.0	0.0
95 Nonwoven fabric mills	0.0	0.0	0.0	0.0
96 Knit fabric mills	0.0	0.0	0.0	0.0
97 Textile and fabric finishing mills	0.0	0.0	0.0	0.0
98 Fabric coating mills	0.0	0.0	0.0	0.0
99 Carpet and rug mills	0.0	0.0	0.0	0.0
100 Curtain and linen mills	0.6	0.0	0.2	0.9

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2006 Petroleum Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
101 Textile bag and canvas mills	0.1	0.0	0.0	0.1
102 Tire cord and tire fabric mills	0.0	0.0	0.0	0.0
103 Other miscellaneous textile product mi	0.0	0.0	0.0	0.0
104 Sheer hosiery mills	0.0	0.0	0.0	0.0
105 Other hosiery and sock mills	0.0	0.0	0.0	0.0
106 Other apparel knitting mills	0.0	0.0	0.0	0.0
107 Cut and sew apparel manufacturing	8.2	0.1	2.9	11.2
108 Accessories and other apparel manufa	0.0	0.0	0.0	0.0
109 Leather and hide tanning and finishing	0.0	0.0	0.0	0.0
110 Footwear manufacturing	0.4	0.0	0.1	0.5
111 Other leather product manufacturing	0.2	0.0	0.1	0.3
112 Sawmills	0.0	0.1	0.2	0.2
113 Wood preservation	0.0	0.0	0.0	0.0
114 Reconstituted wood product manufact	0.0	0.0	0.0	0.0
115 Veneer and plywood manufacturing	0.0	0.0	0.0	0.0
116 Engineered wood member and truss ma	0.0	0.2	0.4	0.6
117 Wood windows and door manufacturi	0.0	0.3	0.7	1.0
118 Cut stock- resawing lumber- and plani	0.0	0.0	0.0	0.0
119 Other millwork- including flooring	0.0	0.6	1.5	2.1
120 Wood container and pallet manufactur	0.3	-0.9	0.5	0.0
121 Manufactured home- mobile home- ma	0.0	0.0	0.0	0.0
122 Prefabricated wood building manufact	0.0	0.0	0.0	0.0
123 Miscellaneous wood product manufact	0.2	0.1	0.1	0.4
124 Pulp mills	0.0	0.0	0.0	0.0
125 Paper and paperboard mills	0.0	0.0	0.0	0.0
126 Paperboard container manufacturing	0.0	0.1	0.0	0.1
127 Flexible packaging foil manufacturing	0.0	0.0	0.0	0.0
128 Surface-coated paperboard manufactu	0.0	0.0	0.0	0.0
129 Coated and laminated paper and packa	0.1	0.2	0.2	0.6
130 Coated and uncoated paper bag manuf	0.0	0.0	0.0	0.0
131 Die-cut paper office supplies manufac	0.0	0.0	0.0	0.0
132 Envelope manufacturing	0.0	0.0	0.0	0.0
133 Stationery and related product manufa	0.0	0.0	0.0	0.0
134 Sanitary paper product manufacturing	0.0	0.0	0.0	0.0
135 All other converted paper product man	0.0	0.0	0.0	0.0
136 Manifold business forms printing	0.0	0.1	0.2	0.3
137 Books printing	0.0	0.0	0.0	0.0
138 Blankbook and looseleaf binder manuf	0.3	0.1	0.2	0.6
139 Commercial printing	0.8	1.3	4.1	6.3
140 Tradebinding and related work	0.0	0.1	0.1	0.2
141 Prepress services	0.0	0.1	0.1	0.1
142 Petroleum refineries	0.0	0.0	0.0	0.0
143 Asphalt paving mixture and block man	0.0	0.1	0.4	0.5
144 Asphalt shingle and coating materials	0.0	0.2	0.3	0.5
145 Petroleum lubricating oil and grease	0.3	0.0	0.2	0.5
146 All other petroleum and coal products	0.0	0.0	0.0	0.0
147 Petrochemical manufacturing	0.1	0.2	0.2	0.5
148 Industrial gas manufacturing	0.0	0.3	0.1	0.5
149 Synthetic dye and pigment manufactur	0.0	0.1	0.1	0.3
150 Other basic inorganic chemical manufa	0.0	0.2	0.2	0.4

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2006 Petroleum Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
151 Other basic organic chemical manufac	0.0	0.3	0.2	0.5
152 Plastics material and resin manufactur	0.0	0.1	0.0	0.1
153 Synthetic rubber manufacturing	0.0	0.0	0.0	0.1
154 Cellulosic organic fiber manufacturing	0.0	0.0	0.0	0.0
155 Noncellulosic organic fiber manufactu	0.0	0.0	0.0	0.0
156 Nitrogenous fertilizer manufacturing	0.0	0.0	0.0	0.1
157 Phosphatic fertilizer manufacturing	0.0	0.0	0.0	0.0
158 Fertilizer- mixing only- manufacturing	0.0	0.0	0.0	0.0
159 Pesticide and other agricultural chemi	0.0	0.0	0.0	0.0
160 Pharmaceutical and medicine manufac	7.3	2.3	3.2	12.9
161 Paint and coating manufacturing	0.0	0.0	0.0	0.0
162 Adhesive manufacturing	0.1	0.2	0.3	0.6
163 Soap and other detergent manufacturin	1.2	0.2	0.5	1.9
164 Polish and other sanitation good manu	0.8	0.1	0.4	1.4
165 Surface active agent manufacturing	0.0	0.0	0.0	0.0
166 Toilet preparation manufacturing	2.3	0.3	0.8	3.4
167 Printing ink manufacturing	0.0	0.0	0.1	0.1
168 Explosives manufacturing	0.0	0.0	0.0	0.0
169 Custom compounding of purchased res	0.0	0.2	0.2	0.4
170 Photographic film and chemical manuf	0.1	0.2	0.5	0.8
171 Other miscellaneous chemical product	0.1	0.5	0.3	0.9
172 Plastics packaging materials- film and	0.5	0.5	0.8	1.9
173 Plastics pipe- fittings- and profile sha	0.0	1.0	0.8	1.9
174 Laminated plastics plate- sheet- and s	0.0	0.2	0.2	0.4
175 Plastics bottle manufacturing	0.0	0.7	0.3	1.0
176 Resilient floor covering manufacturing	0.0	0.0	0.1	0.1
177 Plastics plumbing fixtures and all othe	2.1	4.2	5.0	11.2
178 Foam product manufacturing	0.3	1.6	1.1	3.0
179 Tire manufacturing	0.0	0.0	0.0	0.0
180 Rubber and plastics hose and belting	0.0	0.0	0.0	0.1
181 Other rubber product manufacturing	0.0	0.1	0.1	0.2
182 Vitreous china plumbing fixture manuf	0.0	0.0	0.0	0.0
183 Vitreous china and earthenware articl	0.3	0.0	0.1	0.4
184 Porcelain electrical supply manufactur	0.0	0.0	0.0	0.0
185 Brick and structural clay tile manufac	0.0	0.0	0.0	0.0
186 Ceramic wall and floor tile manufactu	0.0	0.0	0.0	0.0
187 Nonclay refractory manufacturing	0.0	0.0	0.0	0.0
188 Clay refractory and other structural c	0.0	0.0	0.0	0.0
189 Glass container manufacturing	0.0	0.0	0.0	0.0
190 Glass and glass products- except glass	0.4	0.8	0.7	1.9
191 Cement manufacturing	0.0	0.0	0.0	0.0
192 Ready-mix concrete manufacturing	0.0	0.0	0.0	0.0
193 Concrete block and brick manufacturi	0.0	0.0	0.0	0.0
194 Concrete pipe manufacturing	0.0	0.0	0.0	0.0
195 Other concrete product manufacturing	0.0	0.0	0.0	0.0
196 Lime manufacturing	0.0	0.0	0.0	0.0
197 Gypsum product manufacturing	0.0	0.0	0.0	0.0
198 Abrasive product manufacturing	0.0	0.0	0.0	0.0
199 Cut stone and stone product manufact	0.2	0.0	0.6	0.9
200 Ground or treated minerals and earths	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2006 Petroleum Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
201 Mineral wool manufacturing	0.0	0.0	0.0	0.0
202 Miscellaneous nonmetallic mineral pr	0.0	0.0	0.0	0.0
203 Iron and steel mills	0.0	0.0	0.1	0.1
204 Ferroalloy and related product manufa	0.0	0.0	0.0	0.0
205 Iron- steel pipe and tube from purchas	0.0	0.0	0.0	0.0
206 Rolled steel shape manufacturing	0.0	0.0	0.1	0.1
207 Steel wire drawing	0.0	0.0	0.0	0.1
208 Alumina refining	0.0	0.0	0.0	0.0
209 Primary aluminum production	0.0	0.0	0.0	0.0
210 Secondary smelting and alloying of a	0.0	0.0	0.0	0.0
211 Aluminum sheet- plate- and foil manuf	0.0	0.0	0.0	0.0
212 Aluminum extruded product manufact	0.0	0.0	0.0	0.0
213 Other aluminum rolling and drawing	0.0	0.0	0.0	0.0
214 Primary smelting and refining of copp	0.0	0.0	0.0	0.0
215 Primary nonferrous metal- except cop	0.0	0.0	0.0	0.0
216 Copper rolling- drawing- and extrudin	0.0	0.0	0.0	0.0
217 Copper wire- except mechanical- draw	0.0	0.0	0.1	0.1
218 Secondary processing of copper	0.0	0.0	0.0	0.0
219 Nonferrous metal- except copper and	0.0	0.0	0.0	0.1
220 Secondary processing of other nonferr	0.0	0.1	0.0	0.1
221 Ferrous metal foundries	0.0	0.0	0.0	0.0
222 Aluminum foundries	0.0	0.0	0.0	0.1
223 Nonferrous foundries- except alumin	0.0	0.0	0.0	0.0
224 Iron and steel forging	0.0	0.0	0.1	0.1
225 Nonferrous forging	0.0	0.0	0.0	0.0
226 Custom roll forming	0.0	0.0	0.0	0.0
227 All other forging and stamping	0.0	0.1	0.2	0.3
228 Cutlery and flatware- except precious	0.0	0.0	0.0	0.0
229 Hand and edge tool manufacturing	0.3	0.1	0.3	0.6
230 Saw blade and handsaw manufacturin	0.0	0.0	0.1	0.2
231 Kitchen utensil- pot- and pan manufac	0.9	0.1	0.4	1.4
232 Prefabricated metal buildings and co	0.0	0.0	0.0	0.0
233 Fabricated structural metal manufactu	0.0	0.0	0.0	0.0
234 Plate work manufacturing	0.0	0.0	0.0	0.1
235 Metal window and door manufacturing	0.0	0.0	0.0	0.0
236 Sheet metal work manufacturing	0.0	0.0	0.0	0.0
237 Ornamental and architectural metal w	0.0	0.0	0.0	0.0
238 Power boiler and heat exchanger manu	0.0	0.0	0.1	0.1
239 Metal tank- heavy gauge- manufacturi	0.0	0.0	0.0	0.0
240 Metal can- box- and other container m	0.0	0.0	0.0	0.1
241 Hardware manufacturing	0.0	0.0	0.0	0.0
242 Spring and wire product manufacturin	0.0	0.1	0.2	0.3
243 Machine shops	0.0	1.4	1.4	2.7
244 Turned product and screw- nut- and b	0.0	0.3	0.6	0.9
245 Metal heat treating	0.0	0.1	0.1	0.2
246 Metal coating and nonprecious engrav	0.0	0.2	0.1	0.3
247 Electroplating- anodizing- and colorin	0.0	0.3	0.3	0.7
248 Metal valve manufacturing	0.0	0.1	0.5	0.6
249 Ball and roller bearing manufacturing	0.0	0.0	0.0	0.1
250 Small arms manufacturing	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2006 Petroleum Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
251 Other ordnance and accessories manuf	0.0	0.0	0.0	0.0
252 Fabricated pipe and pipe fitting manuf	0.0	0.0	0.2	0.2
253 Industrial pattern manufacturing	0.0	0.0	0.0	0.0
254 Enameled iron and metal sanitary war	0.0	0.0	0.0	0.0
255 Miscellaneous fabricated metal produ	0.0	0.0	0.0	0.0
256 Ammunition manufacturing	0.0	0.0	0.0	0.0
257 Farm machinery and equipment manufa	0.0	0.0	0.1	0.2
258 Lawn and garden equipment manufactu	0.2	0.1	1.7	2.0
259 Construction machinery manufacturin	0.0	0.0	0.1	0.1
260 Mining machinery and equipment manu	0.0	0.0	0.2	0.2
261 Oil and gas field machinery and equi	0.0	0.0	0.0	0.0
262 Sawmill and woodworking machinery	0.1	0.0	0.1	0.2
263 Plastics and rubber industry machiner	0.0	0.0	0.5	0.5
264 Paper industry machinery manufacturi	0.0	0.0	0.1	0.1
265 Textile machinery manufacturing	0.0	0.0	0.1	0.1
266 Printing machinery and equipment man	0.0	0.0	0.2	0.2
267 Food product machinery manufacturin	0.0	0.0	0.2	0.2
268 Semiconductor machinery manufacturi	0.0	0.0	0.0	0.0
269 All other industrial machinery manufa	0.1	0.0	1.6	1.7
270 Office machinery manufacturing	0.0	0.0	0.0	0.0
271 Optical instrument and lens manufactu	0.0	0.0	0.1	0.1
272 Photographic and photocopying equip	0.0	0.0	0.0	0.0
273 Other commercial and service industr	0.0	0.0	1.6	1.6
274 Automatic vending- commercial laund	0.0	0.0	0.0	0.0
275 Air purification equipment manufactur	0.0	0.0	0.0	0.0
276 Industrial and commercial fan and bl	0.0	0.0	0.0	0.0
277 Heating equipment- except warm air f	0.0	0.0	0.0	0.0
278 AC- refrigeration- and forced air heati	0.0	0.0	0.0	0.0
279 Industrial mold manufacturing	0.0	0.0	0.2	0.2
280 Metal cutting machine tool manufactur	0.0	0.0	0.6	0.6
281 Metal forming machine tool manufactu	0.0	0.0	0.0	0.0
282 Special tool- die- jig- and fixture man	0.0	0.1	5.4	5.5
283 Cutting tool and machine tool accesso	0.0	0.1	0.2	0.2
284 Rolling mill and other metalworking m	0.0	0.0	1.1	1.1
285 Turbine and turbine generator set unit	0.0	0.0	0.0	0.0
286 Other engine equipment manufacturin	0.0	0.1	0.1	0.2
287 Speed changers and mechanical power	0.0	0.1	0.5	0.6
288 Pump and pumping equipment manufac	0.0	0.0	0.0	0.0
289 Air and gas compressor manufacturin	0.0	0.0	0.0	0.0
290 Measuring and dispensing pump manuf	0.0	0.0	0.0	0.0
291 Elevator and moving stairway manufac	0.0	0.0	0.1	0.1
292 Conveyor and conveying equipment m	0.0	0.0	0.9	0.9
293 Overhead cranes- hoists- and monorai	0.0	0.0	0.4	0.4
294 Industrial truck- trailer- and stacker m	0.0	0.0	1.0	1.0
295 Power-driven handtool manufacturing	0.1	0.0	0.4	0.5
296 Welding and soldering equipment man	0.0	0.1	7.9	8.0
297 Packaging machinery manufacturing	0.0	0.0	1.0	1.0
298 Industrial process furnace and oven m	0.0	0.0	0.0	0.0
299 Fluid power cylinder and actuator man	0.0	0.0	0.0	0.0
300 Fluid power pump and motor manufact	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type
Cleveland EV 2008 090908.iap

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
301 Scales- balances- and miscellaneous g	0.0	0.1	0.6	0.7
302 Electronic computer manufacturing	0.5	0.0	0.2	0.7
303 Computer storage device manufacturi	0.1	0.1	0.1	0.3
304 Computer terminal manufacturing	0.0	0.1	0.1	0.2
305 Other computer peripheral equipment	0.1	0.0	0.1	0.2
306 Telephone apparatus manufacturing	0.1	0.0	1.3	1.3
307 Broadcast and wireless communicatio	0.1	0.0	0.5	0.7
308 Other communications equipment manu	0.0	0.0	0.2	0.2
309 Audio and video equipment manufactu	0.0	0.0	0.0	0.1
310 Electron tube manufacturing	0.0	0.0	0.0	0.0
311 Semiconductors and related device ma	0.0	0.0	0.0	0.0
312 All other electronic component manufa	0.3	0.6	1.3	2.2
313 Electromedical apparatus manufacturi	0.1	0.7	1.3	2.1
314 Search- detection- and navigation inst	0.0	0.0	0.0	0.0
315 Automatic environmental control manu	0.0	0.0	0.1	0.1
316 Industrial process variable instrument	0.0	0.1	0.9	1.0
317 Totalizing fluid meters and counting d	0.0	0.0	0.0	0.0
318 Electricity and signal testing instrumen	0.0	0.0	0.5	0.6
319 Analytical laboratory instrument manu	0.0	0.0	0.0	0.0
320 Irradiation apparatus manufacturing	0.0	0.0	0.4	0.5
321 Watch- clock- and other measuring and	0.1	0.0	0.1	0.2
322 Software reproducing	0.0	0.0	0.1	0.1
323 Audio and video media reproduction	0.0	0.0	0.0	0.0
324 Magnetic and optical recording media	0.0	0.0	0.0	0.0
325 Electric lamp bulb and part manufactu	0.0	0.0	0.0	0.0
326 Lighting fixture manufacturing	0.0	0.0	0.0	0.0
327 Electric housewares and household fa	0.0	0.0	0.0	0.0
328 Household vacuum cleaner manufactu	0.8	0.0	0.5	1.3
329 Household cooking appliance manufac	0.0	0.0	0.0	0.0
330 Household refrigerator and home free	0.0	0.0	0.0	0.0
331 Household laundry equipment manufac	0.0	0.0	0.0	0.0
332 Other major household appliance manu	0.0	0.0	0.0	0.0
333 Electric power and specialty transfor	0.0	0.0	0.0	0.0
334 Motor and generator manufacturing	0.0	0.0	0.1	0.1
335 Switchgear and switchboard apparatus	0.0	0.2	0.4	0.6
336 Relay and industrial control manufactu	0.0	0.1	0.3	0.4
337 Storage battery manufacturing	0.0	0.0	0.0	0.1
338 Primary battery manufacturing	0.0	0.0	0.0	0.0
339 Fiber optic cable manufacturing	0.0	0.0	0.0	0.0
340 Other communication and energy wire	0.0	0.1	0.2	0.3
341 Wiring device manufacturing	0.0	0.0	0.0	0.0
342 Carbon and graphite product manufact	0.0	0.0	0.0	0.0
343 Miscellaneous electrical equipment m	0.1	0.0	0.3	0.4
344 Automobile and light truck manufactu	3.8	0.0	3.0	6.8
345 Heavy duty truck manufacturing	0.0	0.0	0.0	0.0
346 Motor vehicle body manufacturing	0.0	0.1	0.1	0.2
347 Truck trailer manufacturing	0.0	0.0	0.7	0.7
348 Motor home manufacturing	0.0	0.0	0.0	0.0
349 Travel trailer and camper manufacturi	0.3	0.0	0.1	0.4
350 Motor vehicle parts manufacturing	1.1	1.9	2.2	5.3

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2006 Petroleum Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
351 Aircraft manufacturing	0.0	0.0	0.0	0.0
352 Aircraft engine and engine parts manu	0.0	0.2	0.5	0.7
353 Other aircraft parts and equipment	0.0	0.0	0.3	0.3
354 Guided missile and space vehicle man	0.0	0.0	0.0	0.0
355 Propulsion units and parts for space v	0.0	0.0	0.0	0.0
356 Railroad rolling stock manufacturing	0.0	0.0	0.0	0.0
357 Ship building and repairing	0.0	0.0	0.0	0.0
358 Boat building	0.0	0.0	0.0	0.0
359 Motorcycle- bicycle- and parts manufa	0.1	0.0	0.1	0.2
360 Military armored vehicles and tank pa	0.0	0.0	0.0	0.0
361 All other transportation equipment ma	0.0	0.0	0.0	0.0
362 Wood kitchen cabinet and countertop	0.6	1.6	4.5	6.7
363 Upholstered household furniture manu	0.3	0.0	0.1	0.4
364 Nonupholstered wood household furni	2.0	0.0	0.8	2.8
365 Metal household furniture manufactur	0.1	0.0	0.0	0.2
366 Institutional furniture manufacturing	0.0	0.0	0.1	0.1
367 Other household and institutional furni	0.0	0.0	0.0	0.1
368 Wood office furniture manufacturing	0.0	0.0	0.3	0.3
369 Custom architectural woodwork and m	0.0	0.0	0.7	0.7
370 Office furniture- except wood- manufa	0.0	0.0	0.1	0.1
371 Showcases- partitions- shelving- and l	0.0	0.1	2.2	2.3
372 Mattress manufacturing	1.6	0.0	0.8	2.4
373 Blind and shade manufacturing	0.4	0.0	0.1	0.6
374 Laboratory apparatus and furniture ma	0.0	0.0	1.4	1.5
375 Surgical and medical instrument manu	0.1	2.0	2.2	4.3
376 Surgical appliance and supplies manuf	1.6	2.3	3.0	6.9
377 Dental equipment and supplies manufa	0.0	0.7	0.8	1.5
378 Ophthalmic goods manufacturing	0.9	0.0	0.3	1.3
379 Dental laboratories	0.0	3.6	1.2	4.8
380 Jewelry and silverware manufacturing	0.4	0.0	0.1	0.5
381 Sporting and athletic goods manufactu	0.0	0.0	0.0	0.1
382 Doll- toy- and game manufacturing	4.1	0.2	1.5	5.8
383 Office supplies- except paper- manufa	0.0	0.0	0.0	0.1
384 Sign manufacturing	0.0	0.0	0.6	0.6
385 Gasket- packing- and sealing device	0.0	0.0	0.0	0.0
386 Musical instrument manufacturing	1.3	0.1	0.7	2.1
387 Broom- brush- and mop manufacturing	0.1	0.0	0.1	0.2
388 Burial casket manufacturing	0.0	0.0	0.0	0.0
389 Buttons- pins- and all other miscella	0.1	0.0	0.1	0.2
390 Wholesale trade	-167.2	3.3	10.3	-153.6
391 Air transportation	3.0	0.6	1.6	5.2
392 Rail transportation	-15.8	6.5	1.7	-7.6
393 Water transportation	-4.7	0.3	0.7	-3.7
394 Truck transportation	-29.5	11.0	29.3	10.8
395 Transit and ground passenger transpor	5.3	1.0	3.1	9.4
396 Pipeline transportation	-2.0	1.7	0.1	-0.2
397 Scenic and sightseeing transportation	1.4	-3.6	4.4	2.2
398 Postal service	7.1	11.8	12.8	31.6
399 Couriers and messengers	0.0	1.3	7.4	8.7
400 Warehousing and storage	0.5	-2.2	5.2	3.6

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2006 Petroleum Displace w Refine MULTIPLIER: Type
Cleveland EV 2008 090908.iap

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
401 Motor vehicle and parts dealers	147.0	2.1	54.5	203.5
402 Furniture and home furnishings stores	37.8	0.7	14.2	52.7
403 Electronics and appliance stores	36.8	0.7	14.9	52.5
404 Building material and garden supply s	86.8	1.5	32.7	121.0
405 Food and beverage stores	211.5	3.0	78.9	293.4
406 Health and personal care stores	77.9	1.4	29.5	108.7
407 Gasoline stations	-2,178.7	0.9	19.2	-2,158.6
408 Clothing and clothing accessories stor	105.5	1.4	38.5	145.4
409 Sporting goods- hobby- book and musi	46.4	0.7	17.8	64.8
410 General merchandise stores	182.0	2.6	66.9	251.5
411 Miscellaneous store retailers	88.4	1.3	33.2	122.8
412 Nonstore retailers	111.6	1.9	41.6	155.1
413 Newspaper publishers	2.2	-0.2	3.7	5.7
414 Periodical publishers	1.1	0.2	1.1	2.5
415 Book publishers	1.2	0.3	0.7	2.1
416 Database- directory- and other publish	0.7	0.2	1.3	2.2
417 Software publishers	1.2	0.1	0.9	2.1
418 Motion picture and video industries	4.0	3.3	3.0	10.3
419 Sound recording industries	0.7	0.1	0.3	1.1
420 Radio and television broadcasting	0.9	0.3	1.9	3.1
421 Cable networks and program distribut	0.2	0.0	0.1	0.3
422 Telecommunications	18.3	5.8	12.3	36.4
423 Information services	0.5	0.3	0.5	1.2
424 Data processing services	0.0	0.6	1.0	1.6
425 Nondepository credit intermediation an	13.8	8.6	14.3	36.7
426 Securities- commodity contracts- inve	29.9	35.5	26.0	91.4
427 Insurance carriers	45.6	10.9	20.8	77.3
428 Insurance agencies- brokerages- and r	0.0	22.6	8.3	30.9
429 Funds- trusts- and other financial vehi	13.3	0.3	4.8	18.3
430 Monetary authorities and depository c	45.1	6.4	19.2	70.7
431 Real estate	126.4	75.5	107.8	309.7
432 Automotive equipment rental and leas	8.1	1.2	4.2	13.5
433 Video tape and disc rental	8.0	0.0	2.7	10.7
434 Machinery and equipment rental and l	0.0	0.9	1.3	2.2
435 General and consumer goods rental ex	3.4	0.7	2.9	7.0
436 Lessors of nonfinancial intangible asse	0.0	0.6	0.2	0.8
437 Legal services	34.7	29.9	26.6	91.2
438 Accounting and bookkeeping services	2.8	13.5	15.9	32.2
439 Architectural and engineering services	0.0	14.9	24.8	39.7
440 Specialized design services	0.3	1.2	1.9	3.4
441 Custom computer programming servic	0.1	0.7	28.6	29.4
442 Computer systems design services	0.5	4.4	8.7	13.6
443 Other computer related services- includ	0.2	1.2	2.0	3.4
444 Management consulting services	0.3	9.0	10.2	19.6
445 Environmental and other technical cons	0.0	2.7	2.6	5.3
446 Scientific research and development s	5.4	5.1	7.6	18.0
447 Advertising and related services	0.1	-0.4	6.9	6.5
448 Photographic services	5.0	0.7	2.2	7.9
449 Veterinary services	26.8	1.3	9.5	37.6
450 All other miscellaneous professional a	0.0	2.8	1.8	4.6

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2006 Petroleum Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
451 Management of companies and enterpr	0.0	-5.3	14.1	8.7
452 Office administrative services	0.0	5.6	4.8	10.4
453 Facilities support services	0.0	0.7	2.3	3.0
454 Employment services	2.0	63.9	54.2	120.1
455 Business support services	2.6	8.2	7.3	18.1
456 Travel arrangement and reservation se	4.6	1.1	2.6	8.3
457 Investigation and security services	1.3	8.6	18.0	27.9
458 Services to buildings and dwellings	10.4	30.7	27.9	68.9
459 Other support services	0.3	1.7	3.1	5.1
460 Waste management and remediation se	1.0	3.3	3.4	7.7
461 Elementary and secondary schools	72.6	0.0	27.1	99.7
462 Colleges- universities- and junior coll	91.4	3.3	33.5	128.1
463 Other educational services	47.6	3.9	18.5	70.0
464 Home health care services	93.3	0.0	30.3	123.6
465 Offices of physicians- dentists- and ot	312.3	0.0	99.6	411.9
466 Other ambulatory health care services	69.1	4.9	24.7	98.6
467 Hospitals	345.2	0.0	110.6	455.8
468 Nursing and residential care facilities	209.3	0.0	67.7	277.1
469 Child day care services	101.3	0.0	35.1	136.5
470 Social assistance- except child day ca	166.1	0.0	57.3	223.4
471 Performing arts companies	19.3	10.3	10.4	40.0
472 Spectator sports	8.9	2.4	4.7	16.0
473 Independent artists- writers- and perf	0.0	1.4	0.8	2.2
474 Promoters of performing arts and spor	7.5	2.0	3.8	13.3
475 Museums- historical sites- zoos- and	8.8	0.0	2.9	11.7
476 Fitness and recreational sports centers	35.4	1.2	12.8	49.5
477 Bowling centers	5.7	0.4	2.2	8.3
478 Other amusement- gambling- and recrea	69.1	0.5	23.8	93.5
479 Hotels and motels- including casino ho	27.6	7.1	16.8	51.6
480 Other accommodations	3.2	0.0	1.1	4.4
481 Food services and drinking places	595.2	36.8	218.0	850.0
482 Car washes	12.3	0.3	4.7	17.3
483 Automotive repair and maintenance- e	58.9	2.8	24.4	86.2
484 Electronic equipment repair and main	0.6	0.4	2.7	3.7
485 Commercial machinery repair and mai	0.0	1.2	2.3	3.5
486 Household goods repair and maintena	3.1	0.6	2.0	5.7
487 Personal care services	66.8	2.1	22.1	91.0
488 Death care services	16.2	0.0	4.7	20.9
489 Drycleaning and laundry services	20.6	6.0	11.4	38.0
490 Other personal services	23.6	0.4	8.7	32.6
491 Religious organizations	12.5	0.0	4.1	16.7
492 Grantmaking and giving and social ad	41.5	0.0	14.3	55.8
493 Civic- social- professional and similar	69.4	26.9	36.5	132.8
494 Private households	142.0	0.0	48.4	190.4
495 Federal electric utilities	0.0	0.0	0.0	0.0
496 Other Federal Government enterprises	0.0	0.1	0.2	0.3
497 State and local government passenger t	8.3	1.5	4.8	14.7
498 State and local government electric uti	81.4	0.4	1.8	83.6
499 Other State and local government ente	24.9	5.5	11.9	42.2
500 Noncomparable imports	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2006 Petroleum Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
501 Scrap	0.0	0.0	0.0	0.0
502 Used and secondhand goods	0.0	0.0	0.0	0.0
503 State & Local Education	0.0	0.0	312.0	312.0
504 State & Local Non-Education	0.0	0.0	206.0	206.0
505 Federal Military	0.0	0.0	28.4	28.4
506 Federal Non-Military	0.0	0.0	38.4	38.4
507 Rest of the world adjustment to final	0.0	0.0	0.0	0.0
508 Inventory valuation adjustment	0.0	0.0	0.0	0.0
509 Owner-occupied dwellings	0.0	0.0	0.0	0.0
11,001 Federal Government NonDefense	0.0	0.0	0.0	0.0
11,003 Federal Government Investment	0.0	0.0	0.0	0.0
12,001 State/Local Govt NonEducation	0.0	0.0	0.0	0.0
12,003 State/Local Govt Investment	0.0	0.0	0.0	0.0
14,001 Capital	0.0	0.0	0.0	0.0
14,002 Inventory Additions/Deletions	0.0	0.0	0.0	0.0
25,001 Foreign Trade	0.0	0.0	0.0	0.0
28,001 Domestic Trade	0.0	0.0	0.0	0.0
	2,476.4	714.9	3,056.3	6,247.7

*Number of Jobs

Version:2.0.1025

Report IM020



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
1 Oilseed farming	2,654	-104	1,895	4,445	1.00
2 Grain farming	6,570	5,564	4,526	16,660	1.00
3 Vegetable and melon farming	142,479	4,543	49,442	196,464	1.00
4 Tree nut farming	35	6	13	54	1.00
5 Fruit farming	48,068	3,193	16,602	67,864	1.00
6 Greenhouse and nursery production	577,065	136,537	309,552	1,023,154	1.00
7 Tobacco farming	0	0	0	0	1.00
8 Cotton farming	0	0	0	0	1.00
9 Sugarcane and sugar beet farming	0	0	0	0	1.00
10 All other crop farming	5,895	32,141	22,867	60,903	1.00
11 Cattle ranching and farming	16,009	611,169	230,761	857,939	1.00
12 Poultry and egg production	23,176	9,921	11,428	44,525	1.00
13 Animal production- except cattle and	95,832	50,597	51,186	197,615	1.00
14 Logging	0	11,049	26,162	37,212	1.00
15 Forest nurseries- forest products- and	0	0	0	0	1.00
16 Fishing	0	0	0	0	1.00
17 Hunting and trapping	34,460	368	11,901	46,729	1.00
18 Agriculture and forestry support activi	2,711	4,097	2,708	9,516	1.00
19 Oil and gas extraction	-7,657,434	17,989,350	2,271,477	12,603,392	1.00
20 Coal mining	16	15,768	584	16,367	1.00
21 Iron ore mining	0	0	0	0	1.00
22 Copper- nickel- lead- and zinc mining	0	0	0	0	1.00
23 Gold- silver- and other metal ore mini	0	0	0	0	1.00
24 Stone mining and quarrying	0	278	1,043	1,322	1.00
25 Sand- gravel- clay- and refractory min	0	1,028	3,458	4,487	1.00
26 Other nonmetallic mineral mining	104	12,027	17,583	29,715	1.00
27 Drilling oil and gas wells	0	3,944	167,833	171,777	1.00
28 Support activities for oil and gas oper	0	49,739	60,417	110,155	1.00
29 Support activities for other mining	0	11	4,847	4,858	1.00
30 Power generation and supply	179,993,232	1,850,208	6,397,585	188,241,024	1.00
31 Natural gas distribution	3,427,154	290,314	1,620,031	5,337,500	1.00
32 Water- sewage and other systems	390,194	127,211	186,217	703,621	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
33 New residential 1-unit structures- all	0	0	17,250,776	17,250,776	1.00
34 New multifamily housing structures- a	0	0	2,051,581	2,051,581	1.00
35 New residential additions and alteratio	0	0	4,655,673	4,655,673	1.00
36 New farm housing units	0	0	0	0	1.00
37 Manufacturing and industrial building	0	0	1,907,453	1,907,453	1.00
38 Commercial and institutional building	0	0	11,854,436	11,854,436	1.00
39 Highway- street- bridge- and tunnel co	0	0	2,472,576	2,472,576	1.00
40 Water- sewer- and pipeline constructi	0	0	1,499,697	1,499,697	1.00
41 Other new construction	0	0	3,302,596	3,302,596	1.00
42 Maintenance and repair of farm and n	0	828,297	1,144,981	1,973,278	1.00
43 Maintenance and repair of nonresidenti	0	2,395,077	1,780,381	4,175,458	1.00
44 Maintenance and repair of highways- st	0	0	889,912	889,912	1.00
45 Other maintenance and repair construc	0	2,637,391	371,815	3,009,207	1.00
46 Dog and cat food manufacturing	22,921	11,731	11,347	46,000	1.00
47 Other animal food manufacturing	2,909	2,073	1,774	6,757	1.00
48 Flour milling	49,772	17,836	22,706	90,314	1.00
49 Rice milling	0	0	0	0	1.00
50 Malt manufacturing	0	0	0	0	1.00
51 Wet corn milling	0	0	0	0	1.00
52 Soybean processing	0	0	0	0	1.00
53 Other oilseed processing	0	0	0	0	1.00
54 Fats and oils refining and blending	22,727	11,384	11,923	46,034	1.00
55 Breakfast cereal manufacturing	0	0	0	0	1.00
56 Sugar manufacturing	17,716	7,536	8,906	34,157	1.00
57 Confectionery manufacturing from ca	0	0	0	0	1.00
58 Confectionery manufacturing from pu	46,457	3,318	16,737	66,512	1.00
59 Nonchocolate confectionery manufact	21,011	2,364	8,572	31,948	1.00
60 Frozen food manufacturing	119,442	29,815	50,169	199,426	1.00
61 Fruit and vegetable canning and dryin	51,571	12,558	22,409	86,538	1.00
62 Fluid milk manufacturing	1,724,141	562,536	892,649	3,179,326	1.00
63 Creamery butter manufacturing	0	0	0	0	1.00
64 Cheese manufacturing	1,054,252	710,516	591,689	2,356,457	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
65 Dry- condensed- and evaporated dairy	0	0	0	0	1.00
66 Ice cream and frozen dessert manufact	39,431	72,613	43,925	155,969	1.00
67 Animal- except poultry- slaughtering	23,976	5,001	10,596	39,572	1.00
68 Meat processed from carcasses	225,241	79,995	101,411	406,647	1.00
69 Rendering and meat byproduct proces	106	3,667	1,524	5,297	1.00
70 Poultry processing	252,541	55,059	99,558	407,157	1.00
71 Seafood product preparation and pack	0	0	0	0	1.00
72 Frozen cakes and other pastries manuf	145,902	36,904	59,401	242,207	1.00
73 Bread and bakery product- except fro	2,091,578	621,451	972,986	3,686,015	1.00
74 Cookie and cracker manufacturing	262,395	27,881	94,932	385,208	1.00
75 Mixes and dough made from purchased	655,167	85,803	244,104	985,074	1.00
76 Dry pasta manufacturing	0	0	0	0	1.00
77 Tortilla manufacturing	9,280	4,262	4,475	18,017	1.00
78 Roasted nuts and peanut butter manufa	72,482	5,687	26,855	105,024	1.00
79 Other snack food manufacturing	560,342	202,268	246,227	1,008,837	1.00
80 Coffee and tea manufacturing	11,968	250	4,247	16,465	1.00
81 Flavoring syrup and concentrate manu	5,906	56,673	23,655	86,234	1.00
82 Mayonnaise- dressing- and sauce manu	206,154	83,829	101,833	391,816	1.00
83 Spice and extract manufacturing	430,303	160,585	204,599	795,487	1.00
84 All other food manufacturing	582,108	63,021	206,886	852,014	1.00
85 Soft drink and ice manufacturing	302,923	68,394	119,676	490,992	1.00
86 Breweries	7,081	1,129	2,629	10,838	1.00
87 Wineries	19,184	4,721	7,714	31,619	1.00
88 Distilleries	21,385	7,828	9,510	38,724	1.00
89 Tobacco stemming and redrying	0	0	0	0	1.00
90 Cigarette manufacturing	0	0	0	0	1.00
91 Other tobacco product manufacturing	0	0	0	0	1.00
92 Fiber- yarn- and thread mills	21	41	24	85	1.00
93 Broadwoven fabric mills	1,297	312	618	2,227	1.00
94 Narrow fabric mills and schiffli embro	471	1,133	673	2,277	1.00
95 Nonwoven fabric mills	196	230	231	657	1.00
96 Knit fabric mills	0	0	0	0	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
97 Textile and fabric finishing mills	2,103	10,734	6,493	19,330	1.00
98 Fabric coating mills	908	2,343	5,510	8,762	1.00
99 Carpet and rug mills	0	0	0	0	1.00
100 Curtain and linen mills	185,179	12,505	71,050	268,734	1.00
101 Textile bag and canvas mills	13,021	999	5,597	19,617	1.00
102 Tire cord and tire fabric mills	4	10	7	21	1.00
103 Other miscellaneous textile product mi	5,723	930	2,696	9,349	1.00
104 Sheer hosiery mills	0	0	0	0	1.00
105 Other hosiery and sock mills	0	0	0	0	1.00
106 Other apparel knitting mills	0	0	0	0	1.00
107 Cut and sew apparel manufacturing	1,525,518	24,878	543,994	2,094,390	1.00
108 Accessories and other apparel manufa	4,158	135	1,569	5,861	1.00
109 Leather and hide tanning and finishing	259	491	390	1,140	1.00
110 Footwear manufacturing	86,507	161	28,309	114,977	1.00
111 Other leather product manufacturing	30,663	2,016	11,670	44,350	1.00
112 Sawmills	0	28,642	55,476	84,118	1.00
113 Wood preservation	0	4,480	11,061	15,541	1.00
114 Reconstituted wood product manufact	0	0	0	0	1.00
115 Veneer and plywood manufacturing	0	0	0	0	1.00
116 Engineered wood member and truss ma	0	42,261	97,428	139,689	1.00
117 Wood windows and door manufacturi	469	98,989	189,352	288,810	1.00
118 Cut stock- resawing lumber- and plani	0	0	0	0	1.00
119 Other millwork- including flooring	0	159,236	328,108	487,344	1.00
120 Wood container and pallet manufactur	46,700	-57,041	74,588	64,247	1.00
121 Manufactured home- mobile home- ma	0	0	0	0	1.00
122 Prefabricated wood building manufact	0	23	54	78	1.00
123 Miscellaneous wood product manufact	27,436	9,681	24,323	61,439	1.00
124 Pulp mills	0	0	0	0	1.00
125 Paper and paperboard mills	31	27	30	88	1.00
126 Paperboard container manufacturing	5,521	24,765	17,869	48,155	1.00
127 Flexible packaging foil manufacturing	325	5,763	2,974	9,062	1.00
128 Surface-coated paperboard manufactu	22	2,507	3,367	5,897	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
129 Coated and laminated paper and packa	83,746	131,992	137,657	353,396	1.00
130 Coated and uncoated paper bag manuf	214	312	359	885	1.00
131 Die-cut paper office supplies manufac	411	135	410	956	1.00
132 Envelope manufacturing	101	199	257	557	1.00
133 Stationery and related product manufa	891	235	756	1,882	1.00
134 Sanitary paper product manufacturing	5,139	1,766	2,369	9,274	1.00
135 All other converted paper product man	964	2,163	2,946	6,073	1.00
136 Manifold business forms printing	9,367	34,938	75,513	119,818	1.00
137 Books printing	7	1,159	631	1,798	1.00
138 Blankbook and looseleaf binder manuf	60,739	15,935	52,373	129,046	1.00
139 Commercial printing	85,131	357,691	433,172	875,994	1.00
140 Tradebinding and related work	1,815	8,937	16,317	27,069	1.00
141 Prepress services	1,052	16,751	17,532	35,335	1.00
142 Petroleum refineries	0	0	0	0	1.00
143 Asphalt paving mixture and block man	0	111,672	358,322	469,994	1.00
144 Asphalt shingle and coating materials	0	224,702	305,738	530,440	1.00
145 Petroleum lubricating oil and grease	140,288	56,941	259,404	456,633	1.00
146 All other petroleum and coal products	-44,471	-1,317	5,595	-40,193	1.00
147 Petrochemical manufacturing	-30,544,322	-6,974,594	2,112,432	-35,406,484	1.00
148 Industrial gas manufacturing	33,329	268,173	191,779	493,280	1.00
149 Synthetic dye and pigment manufactur	515	78,294	107,123	185,933	1.00
150 Other basic inorganic chemical manufa	865	87,383	128,171	216,418	1.00
151 Other basic organic chemical manufac	26,683	42,161	330,309	399,153	1.00
152 Plastics material and resin manufactur	10,801	-173,837	78,340	-84,696	1.00
153 Synthetic rubber manufacturing	3,619	13,662	31,368	48,649	1.00
154 Cellulosic organic fiber manufacturing	0	-2	13	12	1.00
155 Noncellulosic organic fiber manufactu	74	135	219	429	1.00
156 Nitrogenous fertilizer manufacturing	3,321	10,523	48,976	62,820	1.00
157 Phosphatic fertilizer manufacturing	0	0	0	0	1.00
158 Fertilizer- mixing only- manufacturing	8	51	76	134	1.00
159 Pesticide and other agricultural chemi	1,912	2,138	2,025	6,076	1.00
160 Pharmaceutical and medicine manufac	8,925,615	2,821,485	3,986,926	15,734,026	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
161 Paint and coating manufacturing	1,346	6,494	14,426	22,266	1.00
162 Adhesive manufacturing	89,302	145,807	194,591	429,700	1.00
163 Soap and other detergent manufacturin	1,635,380	250,767	733,539	2,619,685	1.00
164 Polish and other sanitation good manu	1,209,066	252,090	578,531	2,039,687	1.00
165 Surface active agent manufacturing	0	0	0	0	1.00
166 Toilet preparation manufacturing	2,341,313	304,846	888,340	3,534,499	1.00
167 Printing ink manufacturing	1	42,355	40,843	83,199	1.00
168 Explosives manufacturing	0	0	0	0	1.00
169 Custom compounding of purchased res	102	110,874	126,546	237,522	1.00
170 Photographic film and chemical manuf	78,526	162,627	288,948	530,101	1.00
171 Other miscellaneous chemical product	60,031	298,391	250,338	608,760	1.00
172 Plastics packaging materials- film and	268,710	365,261	426,003	1,059,974	1.00
173 Plastics pipe- fittings- and profile sha	15,627	523,969	441,625	981,222	1.00
174 Laminated plastics plate- sheet- and s	5,552	80,548	70,776	156,876	1.00
175 Plastics bottle manufacturing	1,235	343,342	134,976	479,553	1.00
176 Resilient floor covering manufacturing	2,862	20,939	37,232	61,033	1.00
177 Plastics plumbing fixtures and all othe	609,623	1,343,439	1,438,464	3,391,525	1.00
178 Foam product manufacturing	126,764	714,431	439,205	1,280,400	1.00
179 Tire manufacturing	261	52	465	778	1.00
180 Rubber and plastics hose and belting	2,859	7,920	9,675	20,454	1.00
181 Other rubber product manufacturing	13,961	22,840	27,508	64,308	1.00
182 Vitreous china plumbing fixture manuf	0	0	0	0	1.00
183 Vitreous china and earthenware articl	40,141	716	15,451	56,308	1.00
184 Porcelain electrical supply manufactur	0	0	0	0	1.00
185 Brick and structural clay tile manufac	0	0	0	0	1.00
186 Ceramic wall and floor tile manufactu	0	229	538	767	1.00
187 Nonclay refractory manufacturing	0	43	91	134	1.00
188 Clay refractory and other structural c	0	1	19	20	1.00
189 Glass container manufacturing	0	0	0	0	1.00
190 Glass and glass products- except glass	136,011	268,209	238,038	642,257	1.00
191 Cement manufacturing	0	0	0	0	1.00
192 Ready-mix concrete manufacturing	0	288	946	1,234	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
193 Concrete block and brick manufacturi	0	157	711	868	1.00
194 Concrete pipe manufacturing	0	24	54	78	1.00
195 Other concrete product manufacturing	1,016	218	2,666	3,900	1.00
196 Lime manufacturing	0	15	36	51	1.00
197 Gypsum product manufacturing	2	151	309	462	1.00
198 Abrasive product manufacturing	1,298	1,023	1,439	3,761	1.00
199 Cut stone and stone product manufact	34,562	2,239	84,992	121,793	1.00
200 Ground or treated minerals and earths	0	0	0	1	1.00
201 Mineral wool manufacturing	852	4,931	3,403	9,186	1.00
202 Miscellaneous nonmetallic mineral pr	9,421	547	4,553	14,521	1.00
203 Iron and steel mills	2,434	44,827	120,321	167,582	1.00
204 Ferroalloy and related product manufa	0	0	0	0	1.00
205 Iron- steel pipe and tube from purchas	151	6,178	16,527	22,856	1.00
206 Rolled steel shape manufacturing	665	14,723	39,405	54,793	1.00
207 Steel wire drawing	5,485	6,626	20,629	32,740	1.00
208 Alumina refining	0	0	0	0	1.00
209 Primary aluminum production	0	7	16	23	1.00
210 Secondary smelting and alloying of a	0	163	438	601	1.00
211 Aluminum sheet- plate- and foil manuf	9	1,788	2,808	4,605	1.00
212 Aluminum extruded product manufact	0	14	24	39	1.00
213 Other aluminum rolling and drawing	23	1,232	1,574	2,829	1.00
214 Primary smelting and refining of copp	0	0	0	0	1.00
215 Primary nonferrous metal- except cop	0	0	0	0	1.00
216 Copper rolling- drawing- and extrudin	30	1,358	3,481	4,870	1.00
217 Copper wire- except mechanical- draw	5,703	59,838	115,758	181,299	1.00
218 Secondary processing of copper	0	406	1,160	1,565	1.00
219 Nonferrous metal- except copper and	1,502	19,003	17,743	38,249	1.00
220 Secondary processing of other nonferr	35	32,984	27,723	60,742	1.00
221 Ferrous metal foundaries	2	153	540	695	1.00
222 Aluminum foundries	75	4,226	12,118	16,419	1.00
223 Nonferrous foundries- except alumin	27	1,549	4,474	6,050	1.00
224 Iron and steel forging	23	5,356	40,911	46,290	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
225 Nonferrous forging	0	1,641	8,807	10,448	1.00
226 Custom roll forming	7	2,454	5,016	7,477	1.00
227 All other forging and stamping	6,220	17,998	60,813	85,030	1.00
228 Cutlery and flatware- except precious	2,649	344	1,209	4,202	1.00
229 Hand and edge tool manufacturing	83,578	25,068	87,759	196,405	1.00
230 Saw blade and handsaw manufacturin	8,706	4,111	37,047	49,865	1.00
231 Kitchen utensil- pot- and pan manufac	256,827	31,671	100,867	389,366	1.00
232 Prefabricated metal buildings and co	230	1,127	4,698	6,055	1.00
233 Fabricated structural metal manufactu	0	2,376	7,715	10,091	1.00
234 Plate work manufacturing	0	9,312	12,498	21,810	1.00
235 Metal window and door manufacturing	702	3,023	5,487	9,213	1.00
236 Sheet metal work manufacturing	71	3,393	8,508	11,973	1.00
237 Ornamental and architectural metal w	15	4,388	8,491	12,893	1.00
238 Power boiler and heat exchanger manu	0	1,878	62,999	64,877	1.00
239 Metal tank- heavy gauge- manufacturi	0	-432	2,350	1,918	1.00
240 Metal can- box- and other container m	5,281	25,661	32,984	63,926	1.00
241 Hardware manufacturing	1,292	2,624	5,472	9,389	1.00
242 Spring and wire product manufacturin	7,102	41,141	59,805	108,048	1.00
243 Machine shops	310	229,643	259,642	489,595	1.00
244 Turned product and screw- nut- and b	11,833	73,351	156,744	241,928	1.00
245 Metal heat treating	0	21,208	23,598	44,806	1.00
246 Metal coating and nonprecious engrav	153	32,299	32,712	65,163	1.00
247 Electroplating- anodizing- and colorin	0	70,120	85,653	155,773	1.00
248 Metal valve manufacturing	0	20,752	212,172	232,924	1.00
249 Ball and roller bearing manufacturing	0	12,563	25,680	38,243	1.00
250 Small arms manufacturing	0	0	0	0	1.00
251 Other ordnance and accessories manuf	0	0	0	0	1.00
252 Fabricated pipe and pipe fitting manuf	0	16,717	56,786	73,503	1.00
253 Industrial pattern manufacturing	0	481	10,006	10,487	1.00
254 Enameled iron and metal sanitary war	0	0	0	0	1.00
255 Miscellaneous fabricated metal produ	49	1,002	1,625	2,676	1.00
256 Ammunition manufacturing	44	1	24	69	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
257 Farm machinery and equipment manufa	0	20,894	80,651	101,546	1.00
258 Lawn and garden equipment manufactu	130,506	54,099	1,060,585	1,245,190	1.00
259 Construction machinery manufacturin	938	7,520	97,996	106,454	1.00
260 Mining machinery and equipment manu	0	818	91,399	92,217	1.00
261 Oil and gas field machinery and equi	0	438	5,736	6,175	1.00
262 Sawmill and woodworking machinery	17,584	2,849	27,854	48,287	1.00
263 Plastics and rubber industry machiner	354	6,914	145,566	152,834	1.00
264 Paper industry machinery manufacturi	0	570	24,260	24,830	1.00
265 Textile machinery manufacturing	0	151	19,790	19,940	1.00
266 Printing machinery and equipment man	3	2,660	57,174	59,838	1.00
267 Food product machinery manufacturin	35	5,504	62,427	67,966	1.00
268 Semiconductor machinery manufacturi	0	0	0	0	1.00
269 All other industrial machinery manufa	19,175	-1,196	516,221	534,200	1.00
270 Office machinery manufacturing	0	0	0	0	1.00
271 Optical instrument and lens manufactu	12,504	3,979	18,548	35,032	1.00
272 Photographic and photocopying equip	8,093	653	4,807	13,553	1.00
273 Other commercial and service industr	17	12,157	564,661	576,835	1.00
274 Automatic vending- commercial laund	37	7,347	6,597	13,981	1.00
275 Air purification equipment manufactur	19	59	564	643	1.00
276 Industrial and commercial fan and bl	13	83	251	347	1.00
277 Heating equipment- except warm air f	0	0	1	2	1.00
278 AC- refrigeration- and forced air heati	0	0	0	1	1.00
279 Industrial mold manufacturing	1,133	3,808	32,722	37,664	1.00
280 Metal cutting machine tool manufactur	1,229	849	188,233	190,311	1.00
281 Metal forming machine tool manufactu	20	117	3,715	3,851	1.00
282 Special tool- die- jig- and fixture man	387	11,895	959,578	971,860	1.00
283 Cutting tool and machine tool accesso	17	15,113	39,567	54,696	1.00
284 Rolling mill and other metalworking m	41	992	334,779	335,811	1.00
285 Turbine and turbine generator set unit	0	0	0	0	1.00
286 Other engine equipment manufacturin	27,696	79,567	126,459	233,722	1.00
287 Speed changers and mechanical power	992	35,657	151,374	188,023	1.00
288 Pump and pumping equipment manufac	0	623	2,575	3,198	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
289 Air and gas compressor manufacturin	0	8,635	6,432	15,067	1.00
290 Measuring and dispensing pump manuf	0	3	14	18	1.00
291 Elevator and moving stairway manufac	0	1,991	28,023	30,014	1.00
292 Conveyor and conveying equipment m	62	9,126	396,540	405,728	1.00
293 Overhead cranes- hoists- and monorai	0	3,113	160,478	163,591	1.00
294 Industrial truck- trailer- and stacker m	270	4,754	392,287	397,312	1.00
295 Power-driven handtool manufacturing	81,920	5,950	213,090	300,960	1.00
296 Welding and soldering equipment man	12,017	34,410	3,361,441	3,407,867	1.00
297 Packaging machinery manufacturing	0	5,507	277,023	282,531	1.00
298 Industrial process furnace and oven m	198	637	1,860	2,695	1.00
299 Fluid power cylinder and actuator man	2	130	1,605	1,737	1.00
300 Fluid power pump and motor manufact	51	168	3,202	3,421	1.00
301 Scales- balances- and miscellaneous g	7,356	21,635	217,736	246,727	1.00
302 Electronic computer manufacturing	1,625,196	116,945	862,323	2,604,464	1.00
303 Computer storage device manufacturi	58,283	114,287	121,825	294,395	1.00
304 Computer terminal manufacturing	4,244	33,525	42,285	80,054	1.00
305 Other computer peripheral equipment	66,815	10,964	48,491	126,269	1.00
306 Telephone apparatus manufacturing	79,055	29,570	1,444,004	1,552,629	1.00
307 Broadcast and wireless communicatio	66,040	25,851	393,294	485,185	1.00
308 Other communications equipment manu	251	20,574	96,693	117,517	1.00
309 Audio and video equipment manufactu	43,430	1,024	15,156	59,611	1.00
310 Electron tube manufacturing	197	5,705	11,056	16,959	1.00
311 Semiconductors and related device ma	56	19,281	35,132	54,469	1.00
312 All other electronic component manufa	86,108	174,049	369,235	629,392	1.00
313 Electromedical apparatus manufacturi	73,605	411,644	684,384	1,169,633	1.00
314 Search- detection- and navigation inst	74	32	934	1,040	1.00
315 Automatic environmental control manu	0	8,834	20,186	29,019	1.00
316 Industrial process variable instrument	1,783	4,202	304,751	310,736	1.00
317 Totalizing fluid meters and counting d	0	2,820	3,023	5,843	1.00
318 Electricity and signal testing instrumen	2,768	13,892	188,977	205,637	1.00
319 Analytical laboratory instrument manu	955	1,064	1,589	3,608	1.00
320 Irradiation apparatus manufacturing	1,008	35,062	313,888	349,958	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
321 Watch- clock- and other measuring and	42,423	4,008	47,813	94,243	1.00
322 Software reproducing	0	51,678	57,000	108,678	1.00
323 Audio and video media reproduction	23	3,227	2,410	5,661	1.00
324 Magnetic and optical recording media	802	1,168	1,067	3,038	1.00
325 Electric lamp bulb and part manufactu	64	26	57	146	1.00
326 Lighting fixture manufacturing	201	98	334	633	1.00
327 Electric housewares and household fa	11,052	390	4,151	15,593	1.00
328 Household vacuum cleaner manufactu	364,115	3,336	248,095	615,547	1.00
329 Household cooking appliance manufac	0	0	0	0	1.00
330 Household refrigerator and home free	0	0	0	0	1.00
331 Household laundry equipment manufac	58	0	20	78	1.00
332 Other major household appliance manu	0	0	0	0	1.00
333 Electric power and specialty transfor	213	-1,438	6,532	5,307	1.00
334 Motor and generator manufacturing	2,793	14,362	41,626	58,781	1.00
335 Switchgear and switchboard apparatus	4,938	56,482	179,625	241,044	1.00
336 Relay and industrial control manufactu	696	29,577	125,157	155,429	1.00
337 Storage battery manufacturing	16,489	5,525	10,556	32,569	1.00
338 Primary battery manufacturing	1,368	25	465	1,859	1.00
339 Fiber optic cable manufacturing	682	11,482	12,888	25,052	1.00
340 Other communication and energy wire	249	55,755	87,333	143,338	1.00
341 Wiring device manufacturing	498	3,918	8,280	12,697	1.00
342 Carbon and graphite product manufact	1,568	1,717	10,776	14,061	1.00
343 Miscellaneous electrical equipment m	29,901	10,113	117,131	157,146	1.00
344 Automobile and light truck manufactu	8,171,646	9,361	6,360,896	14,541,902	1.00
345 Heavy duty truck manufacturing	0	0	0	0	1.00
346 Motor vehicle body manufacturing	4,996	23,646	40,917	69,559	1.00
347 Truck trailer manufacturing	14	2,104	261,614	263,733	1.00
348 Motor home manufacturing	0	0	0	0	1.00
349 Travel trailer and camper manufacturi	79,915	1,455	32,934	114,304	1.00
350 Motor vehicle parts manufacturing	613,061	1,144,076	1,213,036	2,970,173	1.00
351 Aircraft manufacturing	9,864	2,917	17,726	30,507	1.00
352 Aircraft engine and engine parts manu	865	101,768	334,296	436,930	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
353 Other aircraft parts and equipment	3,965	3,636	107,412	115,014	1.00
354 Guided missile and space vehicle man	0	0	0	0	1.00
355 Propulsion units and parts for space v	0	0	0	0	1.00
356 Railroad rolling stock manufacturing	124	-59	1,254	1,319	1.00
357 Ship building and repairing	0	-127	139	12	1.00
358 Boat building	8,958	23	3,662	12,643	1.00
359 Motorcycle- bicycle- and parts manufa	90,593	11,464	39,012	141,069	1.00
360 Military armored vehicles and tank pa	4,685	5	3,985	8,675	1.00
361 All other transportation equipment ma	3,347	340	1,662	5,349	1.00
362 Wood kitchen cabinet and countertop	121,343	367,305	911,484	1,400,132	1.00
363 Upholstered household furniture manu	59,637	41	21,272	80,950	1.00
364 Nonupholstered wood household furni	463,947	4,224	177,438	645,608	1.00
365 Metal household furniture manufactur	28,752	131	11,306	40,189	1.00
366 Institutional furniture manufacturing	4,429	1,091	16,791	22,311	1.00
367 Other household and institutional furni	7,453	887	3,776	12,116	1.00
368 Wood office furniture manufacturing	6,470	93	74,879	81,442	1.00
369 Custom architectural woodwork and m	0	5,607	118,629	124,236	1.00
370 Office furniture- except wood- manufa	171	52	27,509	27,732	1.00
371 Showcases- partitions- shelving- and l	1,018	15,537	505,323	521,878	1.00
372 Mattress manufacturing	666,654	361	357,554	1,024,569	1.00
373 Blind and shade manufacturing	93,184	215	33,917	127,317	1.00
374 Laboratory apparatus and furniture ma	6,332	13,317	417,550	437,199	1.00
375 Surgical and medical instrument manu	49,214	790,000	861,010	1,700,225	1.00
376 Surgical appliance and supplies manuf	568,411	846,626	1,076,001	2,491,037	1.00
377 Dental equipment and supplies manufa	2,766	223,763	234,784	461,313	1.00
378 Ophthalmic goods manufacturing	253,766	-527	83,983	337,223	1.00
379 Dental laboratories	0	495,892	165,801	661,693	1.00
380 Jewelry and silverware manufacturing	125,101	2,753	46,982	174,836	1.00
381 Sporting and athletic goods manufactu	11,647	801	5,064	17,512	1.00
382 Doll- toy- and game manufacturing	1,797,747	80,071	654,840	2,532,657	1.00
383 Office supplies- except paper- manufa	15,332	2,198	7,749	25,279	1.00
384 Sign manufacturing	769	49,400	105,957	156,126	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
385 Gasket- packing- and sealing device	1,200	3,754	6,959	11,913	1.00
386 Musical instrument manufacturing	211,851	12,368	121,676	345,895	1.00
387 Broom- brush- and mop manufacturing	23,596	9,925	21,485	55,006	1.00
388 Burial casket manufacturing	0	455	135	590	1.00
389 Buttons- pins- and all other miscella	25,546	12,814	23,034	61,394	1.00
390 Wholesale trade	-28,474,368	808,084	2,690,593	-24,975,690	1.00
391 Air transportation	1,009,602	214,961	550,500	1,775,063	1.00
392 Rail transportation	-3,727,362	1,691,717	611,967	-1,423,678	1.00
393 Water transportation	-2,244,883	200,840	623,641	-1,420,402	1.00
394 Truck transportation	-1,568,969	2,304,927	5,587,138	6,323,095	1.00
395 Transit and ground passenger transpor	324,740	68,277	191,269	584,286	1.00
396 Pipeline transportation	-1,210,809	1,023,576	122,303	-64,930	1.00
397 Scenic and sightseeing transportation	285,147	-84,098	610,080	811,129	1.00
398 Postal service	689,855	1,412,003	1,269,810	3,371,668	1.00
399 Couriers and messengers	0	499,086	716,870	1,215,956	1.00
400 Warehousing and storage	58,560	102,764	562,165	723,489	1.00
401 Motor vehicle and parts dealers	21,058,390	430,246	7,922,158	29,410,794	1.00
402 Furniture and home furnishings stores	4,824,579	120,583	1,838,480	6,783,642	1.00
403 Electronics and appliance stores	2,948,471	84,989	1,213,062	4,246,523	1.00
404 Building material and garden supply s	10,388,241	254,137	3,973,932	14,616,310	1.00
405 Food and beverage stores	16,744,938	345,052	6,340,648	23,430,638	1.00
406 Health and personal care stores	7,465,080	188,387	2,864,877	10,518,344	1.00
407 Gasoline stations	-184,590,192	154,544	2,446,864	-181,988,784	1.00
408 Clothing and clothing accessories stor	9,240,763	176,310	3,427,857	12,844,930	1.00
409 Sporting goods- hobby- book and musi	3,566,331	78,228	1,384,225	5,028,784	1.00
410 General merchandise stores	13,655,006	281,089	5,095,215	19,031,310	1.00
411 Miscellaneous store retailers	5,285,878	108,766	2,012,182	7,406,826	1.00
412 Nonstore retailers	10,637,361	255,910	4,021,747	14,915,018	1.00
413 Newspaper publishers	375,276	344,864	631,157	1,351,297	1.00
414 Periodical publishers	361,793	219,014	373,662	954,469	1.00
415 Book publishers	503,561	118,939	303,633	926,133	1.00
416 Database- directory- and other publish	296,249	399,404	592,865	1,288,518	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
417 Software publishers	517,895	28,003	357,607	903,505	1.00
418 Motion picture and video industries	818,133	733,496	621,222	2,172,851	1.00
419 Sound recording industries	319,276	49,120	124,734	493,130	1.00
420 Radio and television broadcasting	248,386	383,417	528,457	1,160,260	1.00
421 Cable networks and program distribut	285,237	13,222	107,056	405,515	1.00
422 Telecommunications	9,101,981	3,669,715	6,182,642	18,954,338	1.00
423 Information services	203,188	150,780	198,400	552,368	1.00
424 Data processing services	7,193	210,020	243,710	460,923	1.00
425 Nondepository credit intermediation an	2,822,028	2,543,746	2,984,380	8,350,153	1.00
426 Securities- commodity contracts- inve	5,545,972	6,668,841	4,923,761	17,138,574	1.00
427 Insurance carriers	16,728,844	4,221,314	7,790,210	28,740,368	1.00
428 Insurance agencies- brokerages- and r	0	4,595,676	1,708,322	6,303,998	1.00
429 Funds- trusts- and other financial vehi	5,141,768	116,007	1,901,098	7,158,873	1.00
430 Monetary authorities and depository c	19,198,940	2,889,232	8,328,009	30,416,180	1.00
431 Real estate	23,914,842	18,403,158	20,586,438	62,904,440	1.00
432 Automotive equipment rental and leas	1,984,643	395,601	1,044,245	3,424,490	1.00
433 Video tape and disc rental	599,469	753	208,068	808,290	1.00
434 Machinery and equipment rental and l	12,626	526,413	631,227	1,170,266	1.00
435 General and consumer goods rental ex	303,665	91,969	260,200	655,833	1.00
436 Lessors of nonfinancial intangible asse	0	1,103,494	687,623	1,791,118	1.00
437 Legal services	6,123,104	5,175,166	4,768,061	16,066,330	1.00
438 Accounting and bookkeeping services	418,897	2,512,114	2,402,372	5,333,383	1.00
439 Architectural and engineering services	3,033	2,155,090	4,085,981	6,244,104	1.00
440 Specialized design services	55,412	364,158	363,348	782,919	1.00
441 Custom computer programming servic	11,510	69,173	3,271,658	3,352,340	1.00
442 Computer systems design services	58,220	617,471	942,724	1,618,415	1.00
443 Other computer related services- includ	46,472	378,273	512,980	937,726	1.00
444 Management consulting services	66,687	2,287,615	2,030,852	4,385,155	1.00
445 Environmental and other technical cons	88	166,679	563,869	730,635	1.00
446 Scientific research and development s	983,691	709,479	1,404,597	3,097,766	1.00
447 Advertising and related services	11,052	809,027	1,191,018	2,011,097	1.00
448 Photographic services	524,530	93,070	232,404	850,005	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
449 Veterinary services	2,725,927	130,824	994,603	3,851,354	1.00
450 All other miscellaneous professional a	0	1,637,913	1,201,160	2,839,073	1.00
451 Management of companies and enterpr	0	1,184,226	3,951,339	5,135,565	1.00
452 Office administrative services	2,007	1,918,617	1,394,723	3,315,347	1.00
453 Facilities support services	25	71,128	196,888	268,042	1.00
454 Employment services	73,059	2,720,125	1,984,552	4,777,736	1.00
455 Business support services	329,193	1,292,732	926,714	2,548,639	1.00
456 Travel arrangement and reservation se	807,737	251,255	456,548	1,515,540	1.00
457 Investigation and security services	69,783	564,857	959,812	1,594,452	1.00
458 Services to buildings and dwellings	776,661	2,629,948	2,116,864	5,523,473	1.00
459 Other support services	46,700	588,700	549,307	1,184,707	1.00
460 Waste management and remediation se	258,756	840,087	849,965	1,948,808	1.00
461 Elementary and secondary schools	3,608,717	0	1,380,487	4,989,203	1.00
462 Colleges- universities- and junior coll	8,541,035	294,009	3,195,975	12,031,019	1.00
463 Other educational services	3,688,629	316,231	1,466,629	5,471,489	1.00
464 Home health care services	6,606,776	0	2,186,726	8,793,501	1.00
465 Offices of physicians- dentists- and ot	49,285,456	0	16,076,227	65,361,684	1.00
466 Other ambulatory health care services	13,249,296	935,502	4,824,968	19,009,766	1.00
467 Hospitals	57,326,732	0	18,744,086	76,070,816	1.00
468 Nursing and residential care facilities	14,808,235	0	4,897,185	19,705,420	1.00
469 Child day care services	5,469,862	0	1,942,305	7,412,167	1.00
470 Social assistance- except child day ca	8,068,709	186	2,850,636	10,919,530	1.00
471 Performing arts companies	638,990	347,807	351,907	1,338,703	1.00
472 Spectator sports	1,250,901	432,314	671,553	2,354,769	1.00
473 Independent artists- writers- and perf	2,953	141,570	73,651	218,174	1.00
474 Promoters of performing arts and spor	719,877	223,958	374,648	1,318,483	1.00
475 Museums- historical sites- zoos- and	870,858	0	295,656	1,166,514	1.00
476 Fitness and recreational sports centers	1,562,688	67,449	577,321	2,207,457	1.00
477 Bowling centers	394,844	28,012	152,752	575,608	1.00
478 Other amusement- gambling- and recrea	5,822,065	53,317	2,052,203	7,927,585	1.00
479 Hotels and motels- including casino ho	2,797,720	846,769	1,736,646	5,381,136	1.00
480 Other accommodations	465,595	4,731	168,440	638,767	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
481 Food services and drinking places	40,450,940	2,663,916	15,164,689	58,279,544	1.00
482 Car washes	888,536	51,931	350,588	1,291,055	1.00
483 Automotive repair and maintenance- e	7,214,787	418,985	3,049,407	10,683,178	1.00
484 Electronic equipment repair and main	124,468	101,005	593,204	818,677	1.00
485 Commercial machinery repair and mai	0	314,390	443,380	757,770	1.00
486 Household goods repair and maintena	816,371	193,921	528,550	1,538,843	1.00
487 Personal care services	5,109,465	159,292	1,726,329	6,995,086	1.00
488 Death care services	1,578,135	0	465,001	2,043,136	1.00
489 Drycleaning and laundry services	1,384,545	421,822	780,276	2,586,643	1.00
490 Other personal services	5,583,578	120,639	2,098,537	7,802,754	1.00
491 Religious organizations	2,487,292	0	840,926	3,328,218	1.00
492 Grantmaking and giving and social ad	2,889,358	0	1,022,174	3,911,531	1.00
493 Civic- social- professional and similar	3,860,962	1,514,466	2,067,419	7,442,846	1.00
494 Private households	1,796,120	0	626,186	2,422,306	1.00
495 Federal electric utilities	0	0	0	0	1.00
496 Other Federal Government enterprises	2,502	3,761	5,663	11,926	1.00
497 State and local government passenger t	860,319	180,883	506,720	1,547,922	1.00
498 State and local government electric uti	30,446,156	295,792	1,002,293	31,744,240	1.00
499 Other State and local government ente	8,144,405	1,858,922	3,960,093	13,963,418	1.00
500 Noncomparable imports	0	0	0	0	1.00
501 Scrap	0	0	0	0	1.00
502 Used and secondhand goods	0	0	0	0	1.00
503 State & Local Education	0	0	24,276,482	24,276,482	1.00
504 State & Local Non-Education	0	0	19,688,696	19,688,696	1.00
505 Federal Military	0	0	2,497,532	2,497,532	1.00
506 Federal Non-Military	0	0	10,855,847	10,855,847	1.00
507 Rest of the world adjustment to final	0	0	0	0	1.00
508 Inventory valuation adjustment	0	0	0	0	1.00
509 Owner-occupied dwellings	115,272,264	0	39,957,788	155,230,048	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: A 2008defl Petrol Displace no Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
11001 Federal Government NonDefense	16,855	0	0	16,855	1.00
11003 Federal Government Investment	16,512	0	0	16,512	1.00
12001 State/Local Govt NonEducation	22,815,328	0	0	22,815,328	1.00
12003 State/Local Govt Investment	253,255	0	0	253,255	1.00
14001 Capital	1,967,537	0	0	1,967,537	1.00
14002 Inventory Additions/Deletions	50,063	0	0	50,063	1.00
25001 Foreign Trade	18,282,016	0	0	18,282,016	1.00
28001 Domestic Trade	-291,308,832	0	0	-291,308,832	1.00
Total	345,679,771	139,383,170	464,736,503	949,799,438	

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2008defl Petrol Displace no Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
1 Oilseed farming	0.0	0.0	0.0	0.1
2 Grain farming	0.1	0.1	0.1	0.4
3 Vegetable and melon farming	1.2	0.0	0.4	1.7
4 Tree nut farming	0.0	0.0	0.0	0.0
5 Fruit farming	0.7	0.0	0.3	1.1
6 Greenhouse and nursery production	7.9	1.9	4.2	13.9
7 Tobacco farming	0.0	0.0	0.0	0.0
8 Cotton farming	0.0	0.0	0.0	0.0
9 Sugarcane and sugar beet farming	0.0	0.0	0.0	0.0
10 All other crop farming	0.0	0.2	0.1	0.4
11 Cattle ranching and farming	0.2	6.4	2.4	9.0
12 Poultry and egg production	0.1	0.0	0.0	0.2
13 Animal production- except cattle and	2.8	1.5	1.5	5.7
14 Logging	0.0	0.0	0.1	0.2
15 Forest nurseries- forest products- and	0.0	0.0	0.0	0.0
16 Fishing	0.0	0.0	0.0	0.0
17 Hunting and trapping	0.3	0.0	0.1	0.4
18 Agriculture and forestry support activi	0.1	0.2	0.1	0.4
19 Oil and gas extraction	-22.5	52.9	6.7	37.1
20 Coal mining	0.0	0.0	0.0	0.1
21 Iron ore mining	0.0	0.0	0.0	0.0
22 Copper- nickel- lead- and zinc mining	0.0	0.0	0.0	0.0
23 Gold- silver- and other metal ore mini	0.0	0.0	0.0	0.0
24 Stone mining and quarrying	0.0	0.0	0.0	0.0
25 Sand- gravel- clay- and refractory min	0.0	0.0	0.0	0.0
26 Other nonmetallic mineral mining	0.0	0.1	0.1	0.1
27 Drilling oil and gas wells	0.0	0.0	0.3	0.3
28 Support activities for oil and gas oper	0.0	0.3	0.4	0.7
29 Support activities for other mining	0.0	0.0	0.0	0.0
30 Power generation and supply	351.6	3.6	12.5	367.7
31 Natural gas distribution	5.0	0.4	2.4	7.8
32 Water- sewage and other systems	2.8	0.9	1.3	5.0
33 New residential 1-unit structures- all	0.0	0.0	114.2	114.2
34 New multifamily housing structures- a	0.0	0.0	17.9	17.9
35 New residential additions and alteratio	0.0	0.0	25.7	25.7
36 New farm housing units	0.0	0.0	0.0	0.0
37 Manufacturing and industrial building	0.0	0.0	21.3	21.3
38 Commercial and institutional building	0.0	0.0	120.3	120.3
39 Highway- street- bridge- and tunnel co	0.0	0.0	22.6	22.6
40 Water- sewer- and pipeline constructi	0.0	0.0	12.4	12.4
41 Other new construction	0.0	0.0	35.2	35.2
42 Maintenance and repair of farm and n	0.0	5.9	8.2	14.1
43 Maintenance and repair of nonresidenti	0.0	19.6	14.6	34.2
44 Maintenance and repair of highways- st	0.0	0.0	10.4	10.4
45 Other maintenance and repair construc	0.0	39.1	5.5	44.6
46 Dog and cat food manufacturing	0.0	0.0	0.0	0.0
47 Other animal food manufacturing	0.0	0.0	0.0	0.0
48 Flour milling	0.1	0.0	0.0	0.1
49 Rice milling	0.0	0.0	0.0	0.0
50 Malt manufacturing	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2008defl Petrol Displace no Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
51 Wet corn milling	0.0	0.0	0.0	0.0
52 Soybean processing	0.0	0.0	0.0	0.0
53 Other oilseed processing	0.0	0.0	0.0	0.0
54 Fats and oils refining and blending	0.0	0.0	0.0	0.0
55 Breakfast cereal manufacturing	0.0	0.0	0.0	0.0
56 Sugar manufacturing	0.0	0.0	0.0	0.1
57 Confectionery manufacturing from ca	0.0	0.0	0.0	0.0
58 Confectionery manufacturing from pu	0.1	0.0	0.1	0.2
59 Nonchocolate confectionery manufact	0.1	0.0	0.0	0.1
60 Frozen food manufacturing	0.3	0.1	0.1	0.6
61 Fruit and vegetable canning and dryin	0.1	0.0	0.0	0.2
62 Fluid milk manufacturing	2.9	1.0	1.5	5.4
63 Creamery butter manufacturing	0.0	0.0	0.0	0.0
64 Cheese manufacturing	1.4	0.9	0.8	3.1
65 Dry- condensed- and evaporated dairy	0.0	0.0	0.0	0.0
66 Ice cream and frozen dessert manufact	0.1	0.2	0.1	0.4
67 Animal- except poultry- slaughtering	0.1	0.0	0.0	0.1
68 Meat processed from carcasses	0.5	0.2	0.2	1.0
69 Rendering and meat byproduct proces	0.0	0.0	0.0	0.0
70 Poultry processing	1.1	0.3	0.5	1.8
71 Seafood product preparation and pack	0.0	0.0	0.0	0.0
72 Frozen cakes and other pastries manuf	0.8	0.2	0.3	1.4
73 Bread and bakery product- except fro	14.3	4.3	6.7	25.3
74 Cookie and cracker manufacturing	0.7	0.1	0.2	1.0
75 Mixes and dough made from purchased	1.7	0.2	0.6	2.6
76 Dry pasta manufacturing	0.0	0.0	0.0	0.0
77 Tortilla manufacturing	0.1	0.0	0.0	0.1
78 Roasted nuts and peanut butter manufa	0.1	0.0	0.1	0.2
79 Other snack food manufacturing	1.1	0.4	0.5	2.0
80 Coffee and tea manufacturing	0.0	0.0	0.0	0.0
81 Flavoring syrup and concentrate manu	0.0	0.1	0.0	0.1
82 Mayonnaise- dressing- and sauce manu	0.5	0.2	0.3	1.0
83 Spice and extract manufacturing	0.8	0.3	0.4	1.6
84 All other food manufacturing	2.2	0.2	0.8	3.3
85 Soft drink and ice manufacturing	0.5	0.1	0.2	0.8
86 Breweries	0.0	0.0	0.0	0.0
87 Wineries	0.1	0.0	0.0	0.1
88 Distilleries	0.0	0.0	0.0	0.1
89 Tobacco stemming and redrying	0.0	0.0	0.0	0.0
90 Cigarette manufacturing	0.0	0.0	0.0	0.0
91 Other tobacco product manufacturing	0.0	0.0	0.0	0.0
92 Fiber- yarn- and thread mills	0.0	0.0	0.0	0.0
93 Broadwoven fabric mills	0.0	0.0	0.0	0.0
94 Narrow fabric mills and schiffli embro	0.0	0.0	0.0	0.0
95 Nonwoven fabric mills	0.0	0.0	0.0	0.0
96 Knit fabric mills	0.0	0.0	0.0	0.0
97 Textile and fabric finishing mills	0.0	0.0	0.0	0.1
98 Fabric coating mills	0.0	0.0	0.0	0.0
99 Carpet and rug mills	0.0	0.0	0.0	0.0
100 Curtain and linen mills	1.0	0.1	0.4	1.4

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2008defl Petrol Displace no Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
101 Textile bag and canvas mills	0.1	0.0	0.0	0.1
102 Tire cord and tire fabric mills	0.0	0.0	0.0	0.0
103 Other miscellaneous textile product mi	0.0	0.0	0.0	0.1
104 Sheer hosiery mills	0.0	0.0	0.0	0.0
105 Other hosiery and sock mills	0.0	0.0	0.0	0.0
106 Other apparel knitting mills	0.0	0.0	0.0	0.0
107 Cut and sew apparel manufacturing	12.0	0.2	4.3	16.5
108 Accessories and other apparel manufa	0.0	0.0	0.0	0.1
109 Leather and hide tanning and finishing	0.0	0.0	0.0	0.0
110 Footwear manufacturing	0.6	0.0	0.2	0.8
111 Other leather product manufacturing	0.3	0.0	0.1	0.5
112 Sawmills	0.0	0.1	0.2	0.3
113 Wood preservation	0.0	0.0	0.0	0.1
114 Reconstituted wood product manufact	0.0	0.0	0.0	0.0
115 Veneer and plywood manufacturing	0.0	0.0	0.0	0.0
116 Engineered wood member and truss ma	0.0	0.3	0.6	0.8
117 Wood windows and door manufacturi	0.0	0.5	1.0	1.6
118 Cut stock- resawing lumber- and plani	0.0	0.0	0.0	0.0
119 Other millwork- including flooring	0.0	1.0	2.1	3.1
120 Wood container and pallet manufactur	0.5	-0.6	0.7	0.6
121 Manufactured home- mobile home- ma	0.0	0.0	0.0	0.0
122 Prefabricated wood building manufact	0.0	0.0	0.0	0.0
123 Miscellaneous wood product manufact	0.2	0.1	0.2	0.5
124 Pulp mills	0.0	0.0	0.0	0.0
125 Paper and paperboard mills	0.0	0.0	0.0	0.0
126 Paperboard container manufacturing	0.0	0.1	0.1	0.2
127 Flexible packaging foil manufacturing	0.0	0.0	0.0	0.0
128 Surface-coated paperboard manufactu	0.0	0.0	0.0	0.0
129 Coated and laminated paper and packa	0.2	0.3	0.3	0.9
130 Coated and uncoated paper bag manuf	0.0	0.0	0.0	0.0
131 Die-cut paper office supplies manufac	0.0	0.0	0.0	0.0
132 Envelope manufacturing	0.0	0.0	0.0	0.0
133 Stationery and related product manufa	0.0	0.0	0.0	0.0
134 Sanitary paper product manufacturing	0.0	0.0	0.0	0.0
135 All other converted paper product man	0.0	0.0	0.0	0.0
136 Manifold business forms printing	0.0	0.1	0.3	0.4
137 Books printing	0.0	0.0	0.0	0.0
138 Blankbook and looseleaf binder manuf	0.4	0.1	0.4	0.9
139 Commercial printing	1.2	5.1	6.2	12.5
140 Tradebinding and related work	0.0	0.1	0.2	0.4
141 Prepress services	0.0	0.1	0.1	0.2
142 Petroleum refineries	0.0	0.0	0.0	0.0
143 Asphalt paving mixture and block man	0.0	0.2	0.5	0.7
144 Asphalt shingle and coating materials	0.0	0.3	0.4	0.8
145 Petroleum lubricating oil and grease	0.1	0.1	0.2	0.4
146 All other petroleum and coal products	0.0	0.0	0.0	0.0
147 Petrochemical manufacturing	-3.9	-0.9	0.3	-4.5
148 Industrial gas manufacturing	0.0	0.3	0.2	0.5
149 Synthetic dye and pigment manufactur	0.0	0.1	0.2	0.3
150 Other basic inorganic chemical manufa	0.0	0.2	0.3	0.4

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2008defl Petrol Displace no Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
151 Other basic organic chemical manufac	0.0	0.0	0.3	0.3
152 Plastics material and resin manufactur	0.0	-0.1	0.1	-0.1
153 Synthetic rubber manufacturing	0.0	0.0	0.0	0.1
154 Cellulosic organic fiber manufacturing	0.0	0.0	0.0	0.0
155 Noncellulosic organic fiber manufactu	0.0	0.0	0.0	0.0
156 Nitrogenous fertilizer manufacturing	0.0	0.0	0.0	0.0
157 Phosphatic fertilizer manufacturing	0.0	0.0	0.0	0.0
158 Fertilizer- mixing only- manufacturing	0.0	0.0	0.0	0.0
159 Pesticide and other agricultural chemi	0.0	0.0	0.0	0.0
160 Pharmaceutical and medicine manufac	10.7	3.4	4.8	18.9
161 Paint and coating manufacturing	0.0	0.0	0.0	0.0
162 Adhesive manufacturing	0.2	0.3	0.4	0.8
163 Soap and other detergent manufacturin	1.8	0.3	0.8	2.8
164 Polish and other sanitation good manu	1.2	0.3	0.6	2.1
165 Surface active agent manufacturing	0.0	0.0	0.0	0.0
166 Toilet preparation manufacturing	3.3	0.4	1.3	5.0
167 Printing ink manufacturing	0.0	0.1	0.1	0.2
168 Explosives manufacturing	0.0	0.0	0.0	0.0
169 Custom compounding of purchased res	0.0	0.2	0.3	0.5
170 Photographic film and chemical manuf	0.2	0.4	0.7	1.2
171 Other miscellaneous chemical product	0.1	0.6	0.5	1.2
172 Plastics packaging materials- film and	0.8	1.1	1.2	3.1
173 Plastics pipe- fittings- and profile sha	0.0	1.4	1.2	2.7
174 Laminated plastics plate- sheet- and s	0.0	0.3	0.3	0.7
175 Plastics bottle manufacturing	0.0	1.1	0.4	1.5
176 Resilient floor covering manufacturing	0.0	0.1	0.1	0.2
177 Plastics plumbing fixtures and all othe	3.1	6.7	7.2	17.0
178 Foam product manufacturing	0.5	2.6	1.6	4.6
179 Tire manufacturing	0.0	0.0	0.0	0.0
180 Rubber and plastics hose and belting	0.0	0.0	0.0	0.1
181 Other rubber product manufacturing	0.1	0.1	0.1	0.3
182 Vitreous china plumbing fixture manuf	0.0	0.0	0.0	0.0
183 Vitreous china and earthenware articl	0.4	0.0	0.2	0.6
184 Porcelain electrical supply manufactur	0.0	0.0	0.0	0.0
185 Brick and structural clay tile manufac	0.0	0.0	0.0	0.0
186 Ceramic wall and floor tile manufactu	0.0	0.0	0.0	0.0
187 Nonclay refractory manufacturing	0.0	0.0	0.0	0.0
188 Clay refractory and other structural c	0.0	0.0	0.0	0.0
189 Glass container manufacturing	0.0	0.0	0.0	0.0
190 Glass and glass products- except glass	0.6	1.1	1.0	2.7
191 Cement manufacturing	0.0	0.0	0.0	0.0
192 Ready-mix concrete manufacturing	0.0	0.0	0.0	0.0
193 Concrete block and brick manufacturi	0.0	0.0	0.0	0.0
194 Concrete pipe manufacturing	0.0	0.0	0.0	0.0
195 Other concrete product manufacturing	0.0	0.0	0.0	0.0
196 Lime manufacturing	0.0	0.0	0.0	0.0
197 Gypsum product manufacturing	0.0	0.0	0.0	0.0
198 Abrasive product manufacturing	0.0	0.0	0.0	0.0
199 Cut stone and stone product manufact	0.4	0.0	0.9	1.2
200 Ground or treated minerals and earths	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2008defl Petrol Displace no Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
201 Mineral wool manufacturing	0.0	0.0	0.0	0.0
202 Miscellaneous nonmetallic mineral pr	0.0	0.0	0.0	0.1
203 Iron and steel mills	0.0	0.0	0.1	0.2
204 Ferroalloy and related product manufa	0.0	0.0	0.0	0.0
205 Iron- steel pipe and tube from purchas	0.0	0.0	0.0	0.0
206 Rolled steel shape manufacturing	0.0	0.0	0.1	0.1
207 Steel wire drawing	0.0	0.0	0.0	0.1
208 Alumina refining	0.0	0.0	0.0	0.0
209 Primary aluminum production	0.0	0.0	0.0	0.0
210 Secondary smelting and alloying of a	0.0	0.0	0.0	0.0
211 Aluminum sheet- plate- and foil manuf	0.0	0.0	0.0	0.0
212 Aluminum extruded product manufact	0.0	0.0	0.0	0.0
213 Other aluminum rolling and drawing	0.0	0.0	0.0	0.0
214 Primary smelting and refining of copp	0.0	0.0	0.0	0.0
215 Primary nonferrous metal- except cop	0.0	0.0	0.0	0.0
216 Copper rolling- drawing- and extrudin	0.0	0.0	0.0	0.0
217 Copper wire- except mechanical- draw	0.0	0.1	0.1	0.2
218 Secondary processing of copper	0.0	0.0	0.0	0.0
219 Nonferrous metal- except copper and	0.0	0.0	0.0	0.1
220 Secondary processing of other nonferr	0.0	0.1	0.1	0.1
221 Ferrous metal foundaries	0.0	0.0	0.0	0.0
222 Aluminum foundries	0.0	0.0	0.1	0.1
223 Nonferrous foundries- except alumin	0.0	0.0	0.0	0.0
224 Iron and steel forging	0.0	0.0	0.2	0.2
225 Nonferrous forging	0.0	0.0	0.0	0.0
226 Custom roll forming	0.0	0.0	0.0	0.0
227 All other forging and stamping	0.0	0.1	0.3	0.4
228 Cutlery and flatware- except precious	0.0	0.0	0.0	0.0
229 Hand and edge tool manufacturing	0.4	0.1	0.4	0.9
230 Saw blade and handsaw manufacturin	0.0	0.0	0.2	0.3
231 Kitchen utensil- pot- and pan manufac	1.4	0.2	0.5	2.0
232 Prefabricated metal buildings and co	0.0	0.0	0.0	0.0
233 Fabricated structural metal manufactu	0.0	0.0	0.0	0.0
234 Plate work manufacturing	0.0	0.0	0.0	0.1
235 Metal window and door manufacturing	0.0	0.0	0.0	0.0
236 Sheet metal work manufacturing	0.0	0.0	0.0	0.1
237 Ornamental and architectural metal w	0.0	0.0	0.0	0.1
238 Power boiler and heat exchanger manu	0.0	0.0	0.2	0.2
239 Metal tank- heavy gauge- manufacturi	0.0	0.0	0.0	0.0
240 Metal can- box- and other container m	0.0	0.1	0.1	0.1
241 Hardware manufacturing	0.0	0.0	0.0	0.0
242 Spring and wire product manufacturin	0.0	0.2	0.3	0.5
243 Machine shops	0.0	1.7	1.9	3.7
244 Turned product and screw- nut- and b	0.1	0.4	0.8	1.2
245 Metal heat treating	0.0	0.1	0.1	0.2
246 Metal coating and nonprecious engrav	0.0	0.2	0.2	0.4
247 Electroplating- anodizing- and colorin	0.0	0.4	0.5	0.8
248 Metal valve manufacturing	0.0	0.1	0.7	0.8
249 Ball and roller bearing manufacturing	0.0	0.0	0.1	0.1
250 Small arms manufacturing	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

IMPACT NAME: A 2008defl Petrol Displace no Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

Copyright MIG 2008

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
251 Other ordnance and accessories manuf	0.0	0.0	0.0	0.0
252 Fabricated pipe and pipe fitting manuf	0.0	0.1	0.3	0.3
253 Industrial pattern manufacturing	0.0	0.0	0.0	0.0
254 Enameled iron and metal sanitary war	0.0	0.0	0.0	0.0
255 Miscellaneous fabricated metal produ	0.0	0.0	0.0	0.0
256 Ammunition manufacturing	0.0	0.0	0.0	0.0
257 Farm machinery and equipment manufa	0.0	0.0	0.2	0.2
258 Lawn and garden equipment manufactu	0.3	0.1	2.4	2.8
259 Construction machinery manufacturin	0.0	0.0	0.1	0.2
260 Mining machinery and equipment manu	0.0	0.0	0.3	0.3
261 Oil and gas field machinery and equi	0.0	0.0	0.0	0.0
262 Sawmill and woodworking machinery	0.1	0.0	0.2	0.3
263 Plastics and rubber industry machiner	0.0	0.0	0.7	0.7
264 Paper industry machinery manufacturi	0.0	0.0	0.1	0.1
265 Textile machinery manufacturing	0.0	0.0	0.1	0.1
266 Printing machinery and equipment man	0.0	0.0	0.3	0.3
267 Food product machinery manufacturin	0.0	0.0	0.3	0.3
268 Semiconductor machinery manufacturi	0.0	0.0	0.0	0.0
269 All other industrial machinery manufa	0.1	0.0	2.2	2.3
270 Office machinery manufacturing	0.0	0.0	0.0	0.0
271 Optical instrument and lens manufactu	0.1	0.0	0.1	0.2
272 Photographic and photocopying equip	0.0	0.0	0.0	0.0
273 Other commercial and service industr	0.0	0.0	2.2	2.3
274 Automatic vending- commercial laund	0.0	0.0	0.0	0.1
275 Air purification equipment manufactur	0.0	0.0	0.0	0.0
276 Industrial and commercial fan and bl	0.0	0.0	0.0	0.0
277 Heating equipment- except warm air f	0.0	0.0	0.0	0.0
278 AC- refrigeration- and forced air heati	0.0	0.0	0.0	0.0
279 Industrial mold manufacturing	0.0	0.0	0.2	0.3
280 Metal cutting machine tool manufactur	0.0	0.0	0.8	0.8
281 Metal forming machine tool manufactu	0.0	0.0	0.0	0.0
282 Special tool- die- jig- and fixture man	0.0	0.1	7.5	7.6
283 Cutting tool and machine tool accesso	0.0	0.1	0.3	0.3
284 Rolling mill and other metalworking m	0.0	0.0	1.5	1.5
285 Turbine and turbine generator set unit	0.0	0.0	0.0	0.0
286 Other engine equipment manufacturin	0.0	0.1	0.2	0.3
287 Speed changers and mechanical power	0.0	0.2	0.7	0.9
288 Pump and pumping equipment manufac	0.0	0.0	0.0	0.0
289 Air and gas compressor manufacturin	0.0	0.0	0.0	0.0
290 Measuring and dispensing pump manuf	0.0	0.0	0.0	0.0
291 Elevator and moving stairway manufac	0.0	0.0	0.1	0.1
292 Conveyor and conveying equipment m	0.0	0.0	1.2	1.2
293 Overhead cranes- hoists- and monorai	0.0	0.0	0.5	0.5
294 Industrial truck- trailer- and stacker m	0.0	0.0	1.4	1.4
295 Power-driven handtool manufacturing	0.2	0.0	0.5	0.7
296 Welding and soldering equipment man	0.0	0.1	10.9	11.0
297 Packaging machinery manufacturing	0.0	0.0	1.3	1.4
298 Industrial process furnace and oven m	0.0	0.0	0.0	0.0
299 Fluid power cylinder and actuator man	0.0	0.0	0.0	0.0
300 Fluid power pump and motor manufact	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2008defl Petrol Displace no Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
301 Scales- balances- and miscellaneous g	0.0	0.1	0.8	0.9
302 Electronic computer manufacturing	0.7	0.0	0.4	1.1
303 Computer storage device manufacturi	0.1	0.2	0.2	0.4
304 Computer terminal manufacturing	0.0	0.1	0.1	0.2
305 Other computer peripheral equipment	0.2	0.0	0.1	0.3
306 Telephone apparatus manufacturing	0.1	0.0	1.7	1.9
307 Broadcast and wireless communicatio	0.1	0.1	0.8	0.9
308 Other communications equipment manu	0.0	0.1	0.3	0.4
309 Audio and video equipment manufactu	0.1	0.0	0.0	0.1
310 Electron tube manufacturing	0.0	0.0	0.0	0.0
311 Semiconductors and related device ma	0.0	0.0	0.0	0.1
312 All other electronic component manufa	0.4	0.9	1.8	3.1
313 Electromedical apparatus manufacturi	0.2	1.1	1.8	3.0
314 Search- detection- and navigation inst	0.0	0.0	0.0	0.0
315 Automatic environmental control manu	0.0	0.0	0.1	0.1
316 Industrial process variable instrument	0.0	0.0	1.3	1.3
317 Totalizing fluid meters and counting d	0.0	0.0	0.0	0.0
318 Electricity and signal testing instrumen	0.0	0.1	0.7	0.8
319 Analytical laboratory instrument manu	0.0	0.0	0.0	0.0
320 Irradiation apparatus manufacturing	0.0	0.1	0.6	0.7
321 Watch- clock- and other measuring and	0.2	0.0	0.2	0.4
322 Software reproducing	0.0	0.1	0.1	0.3
323 Audio and video media reproduction	0.0	0.0	0.0	0.0
324 Magnetic and optical recording media	0.0	0.0	0.0	0.0
325 Electric lamp bulb and part manufactu	0.0	0.0	0.0	0.0
326 Lighting fixture manufacturing	0.0	0.0	0.0	0.0
327 Electric housewares and household fa	0.0	0.0	0.0	0.1
328 Household vacuum cleaner manufactu	1.1	0.0	0.8	1.9
329 Household cooking appliance manufac	0.0	0.0	0.0	0.0
330 Household refrigerator and home free	0.0	0.0	0.0	0.0
331 Household laundry equipment manufac	0.0	0.0	0.0	0.0
332 Other major household appliance manu	0.0	0.0	0.0	0.0
333 Electric power and specialty transfor	0.0	0.0	0.0	0.0
334 Motor and generator manufacturing	0.0	0.0	0.1	0.2
335 Switchgear and switchboard apparatus	0.0	0.2	0.6	0.8
336 Relay and industrial control manufactu	0.0	0.1	0.4	0.5
337 Storage battery manufacturing	0.1	0.0	0.0	0.1
338 Primary battery manufacturing	0.0	0.0	0.0	0.0
339 Fiber optic cable manufacturing	0.0	0.0	0.0	0.0
340 Other communication and energy wire	0.0	0.1	0.2	0.4
341 Wiring device manufacturing	0.0	0.0	0.0	0.1
342 Carbon and graphite product manufact	0.0	0.0	0.0	0.0
343 Miscellaneous electrical equipment m	0.1	0.0	0.5	0.6
344 Automobile and light truck manufactu	5.5	0.0	4.3	9.8
345 Heavy duty truck manufacturing	0.0	0.0	0.0	0.0
346 Motor vehicle body manufacturing	0.0	0.1	0.2	0.3
347 Truck trailer manufacturing	0.0	0.0	0.9	0.9
348 Motor home manufacturing	0.0	0.0	0.0	0.0
349 Travel trailer and camper manufacturi	0.4	0.0	0.2	0.5
350 Motor vehicle parts manufacturing	1.6	3.0	3.2	7.9

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

IMPACT NAME: A 2008defl Petrol Displace no Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

Copyright MIG 2008

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
351 Aircraft manufacturing	0.0	0.0	0.0	0.1
352 Aircraft engine and engine parts manu	0.0	0.2	0.7	0.9
353 Other aircraft parts and equipment	0.0	0.0	0.4	0.5
354 Guided missile and space vehicle man	0.0	0.0	0.0	0.0
355 Propulsion units and parts for space v	0.0	0.0	0.0	0.0
356 Railroad rolling stock manufacturing	0.0	0.0	0.0	0.0
357 Ship building and repairing	0.0	0.0	0.0	0.0
358 Boat building	0.0	0.0	0.0	0.1
359 Motorcycle- bicycle- and parts manufa	0.2	0.0	0.1	0.3
360 Military armored vehicles and tank pa	0.0	0.0	0.0	0.0
361 All other transportation equipment ma	0.0	0.0	0.0	0.0
362 Wood kitchen cabinet and countertop	0.8	2.5	6.3	9.7
363 Upholstered household furniture manu	0.4	0.0	0.2	0.6
364 Nonupholstered wood household furni	3.0	0.0	1.1	4.1
365 Metal household furniture manufactur	0.2	0.0	0.1	0.3
366 Institutional furniture manufacturing	0.0	0.0	0.1	0.2
367 Other household and institutional furni	0.0	0.0	0.0	0.1
368 Wood office furniture manufacturing	0.0	0.0	0.4	0.4
369 Custom architectural woodwork and m	0.0	0.0	1.0	1.0
370 Office furniture- except wood- manufa	0.0	0.0	0.1	0.1
371 Showcases- partitions- shelving- and l	0.0	0.1	3.1	3.2
372 Mattress manufacturing	2.3	0.0	1.2	3.5
373 Blind and shade manufacturing	0.6	0.0	0.2	0.8
374 Laboratory apparatus and furniture ma	0.0	0.1	1.9	2.0
375 Surgical and medical instrument manu	0.2	2.9	3.1	6.2
376 Surgical appliance and supplies manuf	2.3	3.4	4.3	10.0
377 Dental equipment and supplies manufa	0.0	1.0	1.1	2.1
378 Ophthalmic goods manufacturing	1.4	0.0	0.5	1.8
379 Dental laboratories	0.0	5.3	1.8	7.1
380 Jewelry and silverware manufacturing	0.5	0.0	0.2	0.7
381 Sporting and athletic goods manufactu	0.1	0.0	0.0	0.1
382 Doll- toy- and game manufacturing	6.0	0.3	2.2	8.5
383 Office supplies- except paper- manufa	0.1	0.0	0.0	0.1
384 Sign manufacturing	0.0	0.4	0.8	1.2
385 Gasket- packing- and sealing device	0.0	0.0	0.0	0.1
386 Musical instrument manufacturing	1.9	0.1	1.1	3.0
387 Broom- brush- and mop manufacturing	0.1	0.0	0.1	0.3
388 Burial casket manufacturing	0.0	0.0	0.0	0.0
389 Buttons- pins- and all other miscella	0.1	0.1	0.1	0.3
390 Wholesale trade	-159.9	4.5	15.1	-140.2
391 Air transportation	4.5	0.9	2.4	7.8
392 Rail transportation	-15.0	6.8	2.5	-5.7
393 Water transportation	-3.8	0.3	1.1	-2.4
394 Truck transportation	-12.1	17.8	43.1	48.7
395 Transit and ground passenger transpor	7.8	1.6	4.6	14.0
396 Pipeline transportation	-2.0	1.7	0.2	-0.1
397 Scenic and sightseeing transportation	3.0	-0.9	6.5	8.6
398 Postal service	10.3	21.1	19.0	50.5
399 Couriers and messengers	0.0	7.6	10.9	18.5
400 Warehousing and storage	0.8	1.4	7.6	9.8

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2008defl Petrol Displace no Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
401 Motor vehicle and parts dealers	215.3	4.4	81.0	300.7
402 Furniture and home furnishings stores	55.4	1.4	21.1	77.9
403 Electronics and appliance stores	53.9	1.6	22.2	77.7
404 Building material and garden supply s	127.2	3.1	48.7	179.0
405 Food and beverage stores	309.8	6.4	117.3	433.6
406 Health and personal care stores	114.1	2.9	43.8	160.7
407 Gasoline stations	-2,154.9	1.8	28.6	-2,124.5
408 Clothing and clothing accessories stor	154.6	2.9	57.3	214.9
409 Sporting goods- hobby- book and musi	67.9	1.5	26.4	95.8
410 General merchandise stores	266.7	5.5	99.5	371.7
411 Miscellaneous store retailers	129.5	2.7	49.3	181.5
412 Nonstore retailers	163.5	3.9	61.8	229.3
413 Newspaper publishers	3.2	3.0	5.4	11.6
414 Periodical publishers	1.6	1.0	1.7	4.3
415 Book publishers	1.7	0.4	1.0	3.1
416 Database- directory- and other publish	1.0	1.3	2.0	4.4
417 Software publishers	1.8	0.1	1.2	3.1
418 Motion picture and video industries	5.9	5.3	4.5	15.7
419 Sound recording industries	1.1	0.2	0.4	1.7
420 Radio and television broadcasting	1.3	2.0	2.8	6.1
421 Cable networks and program distribut	0.3	0.0	0.1	0.4
422 Telecommunications	26.8	10.8	18.2	55.8
423 Information services	0.7	0.5	0.7	2.0
424 Data processing services	0.0	1.3	1.5	2.8
425 Nondepository credit intermediation an	20.2	18.2	21.3	59.7
426 Securities- commodity contracts- inve	43.8	52.7	38.9	135.4
427 Insurance carriers	66.8	16.9	31.1	114.8
428 Insurance agencies- brokerages- and r	0.0	33.5	12.5	46.0
429 Funds- trusts- and other financial vehi	19.4	0.4	7.2	27.0
430 Monetary authorities and depository c	66.1	9.9	28.7	104.6
431 Real estate	185.1	142.5	159.4	487.0
432 Automotive equipment rental and leas	11.8	2.4	6.2	20.4
433 Video tape and disc rental	11.7	0.0	4.1	15.8
434 Machinery and equipment rental and l	0.0	1.6	2.0	3.7
435 General and consumer goods rental ex	5.0	1.5	4.3	10.9
436 Lessors of nonfinancial intangible asse	0.0	0.5	0.3	0.8
437 Legal services	50.8	43.0	39.6	133.4
438 Accounting and bookkeeping services	4.1	24.6	23.6	52.3
439 Architectural and engineering services	0.0	18.8	35.6	54.3
440 Specialized design services	0.4	2.8	2.8	6.0
441 Custom computer programming servic	0.1	0.8	39.8	40.7
442 Computer systems design services	0.8	8.2	12.6	21.6
443 Other computer related services- includ	0.3	2.2	2.9	5.3
444 Management consulting services	0.5	17.1	15.1	32.7
445 Environmental and other technical cons	0.0	1.1	3.8	4.9
446 Scientific research and development s	7.8	5.7	11.2	24.7
447 Advertising and related services	0.1	6.9	10.2	17.2
448 Photographic services	7.4	1.3	3.3	11.9
449 Veterinary services	39.2	1.9	14.3	55.4
450 All other miscellaneous professional a	0.0	3.7	2.7	6.3

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

IMPACT NAME: A 2008defl Petrol Displace no Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

Copyright MIG 2008

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
451 Management of companies and enterpr	0.0	6.2	20.7	26.9
452 Office administrative services	0.0	9.7	7.1	16.8
453 Facilities support services	0.0	1.2	3.4	4.6
454 Employment services	2.9	109.7	80.1	192.7
455 Business support services	3.8	15.1	10.8	29.7
456 Travel arrangement and reservation se	6.8	2.1	3.8	12.8
457 Investigation and security services	1.9	15.7	26.7	44.3
458 Services to buildings and dwellings	15.2	51.4	41.3	107.9
459 Other support services	0.4	4.9	4.5	9.8
460 Waste management and remediation se	1.5	4.9	5.0	11.4
461 Elementary and secondary schools	106.4	0.0	40.7	147.1
462 Colleges- universities- and junior coll	133.9	4.6	50.1	188.6
463 Other educational services	69.7	6.0	27.7	103.4
464 Home health care services	136.7	0.0	45.3	182.0
465 Offices of physicians- dentists- and ot	457.5	0.0	149.2	606.8
466 Other ambulatory health care services	101.3	7.1	36.9	145.3
467 Hospitals	505.7	0.0	165.4	671.1
468 Nursing and residential care facilities	306.7	0.0	101.4	408.1
469 Child day care services	148.4	0.0	52.7	201.1
470 Social assistance- except child day ca	243.3	0.0	86.0	329.3
471 Performing arts companies	28.3	15.4	15.6	59.2
472 Spectator sports	13.1	4.5	7.0	24.6
473 Independent artists- writers- and perf	0.0	2.2	1.2	3.4
474 Promoters of performing arts and spor	11.0	3.4	5.7	20.1
475 Museums- historical sites- zoos- and	12.8	0.0	4.4	17.2
476 Fitness and recreational sports centers	51.9	2.2	19.2	73.3
477 Bowling centers	8.4	0.6	3.3	12.3
478 Other amusement- gambling- and recrea	101.2	0.9	35.7	137.9
479 Hotels and motels- including casino ho	40.4	12.2	25.1	77.8
480 Other accommodations	4.7	0.0	1.7	6.4
481 Food services and drinking places	871.9	57.4	326.9	1,256.2
482 Car washes	18.0	1.1	7.1	26.1
483 Automotive repair and maintenance- e	86.3	5.0	36.5	127.8
484 Electronic equipment repair and main	0.9	0.7	4.1	5.6
485 Commercial machinery repair and mai	0.0	2.4	3.3	5.7
486 Household goods repair and maintena	4.6	1.1	3.0	8.6
487 Personal care services	97.9	3.1	33.1	134.0
488 Death care services	23.7	0.0	7.0	30.7
489 Drycleaning and laundry services	30.2	9.2	17.0	56.4
490 Other personal services	34.5	0.7	13.0	48.2
491 Religious organizations	18.4	0.0	6.2	24.6
492 Grantmaking and giving and social ad	60.7	0.0	21.5	82.2
493 Civic- social- professional and similar	101.7	39.9	54.4	196.0
494 Private households	208.1	0.0	72.5	280.6
495 Federal electric utilities	0.0	0.0	0.0	0.0
496 Other Federal Government enterprises	0.1	0.2	0.3	0.6
497 State and local government passenger t	12.2	2.6	7.2	21.9
498 State and local government electric uti	83.0	0.8	2.7	86.5
499 Other State and local government ente	36.4	8.3	17.7	62.5
500 Noncomparable imports	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: A 2008defl Petrol Displace no Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
501 Scrap	0.0	0.0	0.0	0.0
502 Used and secondhand goods	0.0	0.0	0.0	0.0
503 State & Local Education	0.0	0.0	467.1	467.1
504 State & Local Non-Education	0.0	0.0	308.4	308.4
505 Federal Military	0.0	0.0	42.1	42.1
506 Federal Non-Military	0.0	0.0	56.9	56.9
507 Rest of the world adjustment to final	0.0	0.0	0.0	0.0
508 Inventory valuation adjustment	0.0	0.0	0.0	0.0
509 Owner-occupied dwellings	0.0	0.0	0.0	0.0
11,001 Federal Government NonDefense	0.0	0.0	0.0	0.0
11,003 Federal Government Investment	0.0	0.0	0.0	0.0
12,001 State/Local Govt NonEducation	0.0	0.0	0.0	0.0
12,003 State/Local Govt Investment	0.0	0.0	0.0	0.0
14,001 Capital	0.0	0.0	0.0	0.0
14,002 Inventory Additions/Deletions	0.0	0.0	0.0	0.0
25,001 Foreign Trade	0.0	0.0	0.0	0.0
28,001 Domestic Trade	0.0	0.0	0.0	0.0
	4,577.8	1,157.0	4,526.4	10,261.3

*Number of Jobs

Version:2.0.1025

Report IM020



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
1 Oilseed farming	2,654	502	1,955	5,111	1.00
2 Grain farming	6,570	5,585	4,665	16,819	1.00
3 Vegetable and melon farming	142,479	4,549	50,951	197,978	1.00
4 Tree nut farming	35	6	13	55	1.00
5 Fruit farming	48,068	3,195	17,107	68,370	1.00
6 Greenhouse and nursery production	577,065	137,788	319,080	1,033,932	1.00
7 Tobacco farming	0	0	0	0	1.00
8 Cotton farming	0	0	0	0	1.00
9 Sugarcane and sugar beet farming	0	0	0	0	1.00
10 All other crop farming	5,895	32,678	23,596	62,168	1.00
11 Cattle ranching and farming	16,009	611,374	237,828	865,210	1.00
12 Poultry and egg production	23,176	9,926	11,777	44,879	1.00
13 Animal production- except cattle and	95,832	50,698	52,740	199,271	1.00
14 Logging	0	11,348	27,026	38,374	1.00
15 Forest nurseries- forest products- and	0	0	0	0	1.00
16 Fishing	0	0	0	0	1.00
17 Hunting and trapping	34,460	368	12,261	47,089	1.00
18 Agriculture and forestry support activi	2,711	4,108	2,791	9,610	1.00
19 Oil and gas extraction	398,524	21,162,660	2,341,711	23,902,894	1.00
20 Coal mining	16	15,827	602	16,445	1.00
21 Iron ore mining	0	0	0	0	1.00
22 Copper- nickel- lead- and zinc mining	0	0	0	0	1.00
23 Gold- silver- and other metal ore mini	0	0	0	0	1.00
24 Stone mining and quarrying	0	282	1,078	1,360	1.00
25 Sand- gravel- clay- and refractory min	0	1,042	3,574	4,616	1.00
26 Other nonmetallic mineral mining	104	20,586	18,151	38,841	1.00
27 Drilling oil and gas wells	0	8,231	173,567	181,798	1.00
28 Support activities for oil and gas oper	0	103,798	62,446	166,244	1.00
29 Support activities for other mining	0	17	5,013	5,030	1.00
30 Power generation and supply	179,993,232	2,094,096	6,595,163	188,682,496	1.00
31 Natural gas distribution	3,427,154	545,188	1,669,967	5,642,309	1.00
32 Water- sewage and other systems	390,194	129,117	191,937	711,247	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
33 New residential 1-unit structures- all	0	0	17,840,512	17,840,512	1.00
34 New multifamily housing structures- a	0	0	2,121,481	2,121,481	1.00
35 New residential additions and alteratio	0	0	4,814,379	4,814,379	1.00
36 New farm housing units	0	0	0	0	1.00
37 Manufacturing and industrial building	0	0	1,972,405	1,972,405	1.00
38 Commercial and institutional building	0	0	12,253,695	12,253,695	1.00
39 Highway- street- bridge- and tunnel co	0	0	2,552,782	2,552,782	1.00
40 Water- sewer- and pipeline constructi	0	0	1,548,819	1,548,819	1.00
41 Other new construction	0	0	3,412,042	3,412,042	1.00
42 Maintenance and repair of farm and n	0	829,408	1,182,980	2,012,387	1.00
43 Maintenance and repair of nonresidenti	0	2,478,552	1,835,997	4,314,549	1.00
44 Maintenance and repair of highways- st	0	0	918,756	918,756	1.00
45 Other maintenance and repair construc	0	2,643,980	383,481	3,027,461	1.00
46 Dog and cat food manufacturing	22,921	11,737	11,692	46,350	1.00
47 Other animal food manufacturing	2,909	2,078	1,828	6,815	1.00
48 Flour milling	49,772	17,848	23,399	91,018	1.00
49 Rice milling	0	0	0	0	1.00
50 Malt manufacturing	0	0	0	0	1.00
51 Wet corn milling	0	0	0	0	1.00
52 Soybean processing	0	0	0	0	1.00
53 Other oilseed processing	0	0	0	0	1.00
54 Fats and oils refining and blending	22,727	11,450	12,288	46,465	1.00
55 Breakfast cereal manufacturing	0	0	0	0	1.00
56 Sugar manufacturing	17,716	7,540	9,178	34,433	1.00
57 Confectionery manufacturing from ca	0	0	0	0	1.00
58 Confectionery manufacturing from pu	46,457	3,322	17,245	67,024	1.00
59 Nonchocolate confectionery manufact	21,011	2,367	8,833	32,212	1.00
60 Frozen food manufacturing	119,442	29,857	51,698	200,997	1.00
61 Fruit and vegetable canning and dryin	51,571	12,574	23,094	87,239	1.00
62 Fluid milk manufacturing	1,724,141	563,110	920,091	3,207,342	1.00
63 Creamery butter manufacturing	0	0	0	0	1.00
64 Cheese manufacturing	1,054,252	711,328	609,696	2,375,276	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

Industry	Direct*	Indirect*	Induced*	Total*	Deflator
65 Dry- condensed- and evaporated dairy	0	0	0	0	1.00
66 Ice cream and frozen dessert manufact	39,431	72,708	45,272	157,411	1.00
67 Animal- except poultry- slaughtering	23,976	5,009	10,920	39,905	1.00
68 Meat processed from carcasses	225,241	80,099	104,497	409,837	1.00
69 Rendering and meat byproduct proces	106	3,740	1,570	5,416	1.00
70 Poultry processing	252,541	55,137	102,584	410,262	1.00
71 Seafood product preparation and pack	0	0	0	0	1.00
72 Frozen cakes and other pastries manuf	145,902	36,958	61,207	244,067	1.00
73 Bread and bakery product- except fro	2,091,578	622,519	1,002,746	3,716,844	1.00
74 Cookie and cracker manufacturing	262,395	27,914	97,821	388,130	1.00
75 Mixes and dough made from purchased	655,167	85,892	251,540	992,599	1.00
76 Dry pasta manufacturing	0	0	0	0	1.00
77 Tortilla manufacturing	9,280	4,267	4,611	18,158	1.00
78 Roasted nuts and peanut butter manufa	72,482	5,693	27,673	105,847	1.00
79 Other snack food manufacturing	560,342	202,575	253,705	1,016,622	1.00
80 Coffee and tea manufacturing	11,968	250	4,377	16,595	1.00
81 Flavoring syrup and concentrate manu	5,906	56,728	24,379	87,013	1.00
82 Mayonnaise- dressing- and sauce manu	206,154	83,948	104,944	395,045	1.00
83 Spice and extract manufacturing	430,303	160,695	210,848	801,846	1.00
84 All other food manufacturing	582,108	63,065	213,177	858,350	1.00
85 Soft drink and ice manufacturing	302,923	68,493	123,312	494,728	1.00
86 Breweries	7,081	1,131	2,708	10,920	1.00
87 Wineries	19,184	4,728	7,948	31,860	1.00
88 Distilleries	21,385	7,843	9,799	39,027	1.00
89 Tobacco stemming and redrying	0	0	0	0	1.00
90 Cigarette manufacturing	0	0	0	0	1.00
91 Other tobacco product manufacturing	0	0	0	0	1.00
92 Fiber- yarn- and thread mills	21	41	24	86	1.00
93 Broadwoven fabric mills	1,297	312	637	2,246	1.00
94 Narrow fabric mills and schiffli embro	471	1,140	694	2,305	1.00
95 Nonwoven fabric mills	196	230	239	665	1.00
96 Knit fabric mills	0	0	0	0	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
97 Textile and fabric finishing mills	2,103	10,745	6,695	19,543	1.00
98 Fabric coating mills	908	2,394	5,679	8,981	1.00
99 Carpet and rug mills	0	0	0	0	1.00
100 Curtain and linen mills	185,179	12,526	73,209	270,914	1.00
101 Textile bag and canvas mills	13,021	1,007	5,768	19,796	1.00
102 Tire cord and tire fabric mills	4	10	7	21	1.00
103 Other miscellaneous textile product mi	5,723	936	2,779	9,438	1.00
104 Sheer hosiery mills	0	0	0	0	1.00
105 Other hosiery and sock mills	0	0	0	0	1.00
106 Other apparel knitting mills	0	0	0	0	1.00
107 Cut and sew apparel manufacturing	1,525,518	24,924	560,493	2,110,935	1.00
108 Accessories and other apparel manufa	4,158	136	1,616	5,909	1.00
109 Leather and hide tanning and finishing	259	492	402	1,154	1.00
110 Footwear manufacturing	86,507	161	29,167	115,835	1.00
111 Other leather product manufacturing	30,663	2,058	12,024	44,746	1.00
112 Sawmills	0	29,352	57,308	86,660	1.00
113 Wood preservation	0	4,584	11,430	16,014	1.00
114 Reconstituted wood product manufact	0	0	0	0	1.00
115 Veneer and plywood manufacturing	0	0	0	0	1.00
116 Engineered wood member and truss ma	0	43,101	100,685	143,786	1.00
117 Wood windows and door manufacturi	469	101,046	195,615	297,130	1.00
118 Cut stock- resawing lumber- and plani	0	0	0	0	1.00
119 Other millwork- including flooring	0	162,256	338,999	501,255	1.00
120 Wood container and pallet manufactur	46,700	-55,861	76,943	67,782	1.00
121 Manufactured home- mobile home- ma	0	0	0	0	1.00
122 Prefabricated wood building manufact	0	24	56	80	1.00
123 Miscellaneous wood product manufact	27,436	9,825	25,090	62,350	1.00
124 Pulp mills	0	0	0	0	1.00
125 Paper and paperboard mills	31	27	31	90	1.00
126 Paperboard container manufacturing	5,521	25,131	18,431	49,083	1.00
127 Flexible packaging foil manufacturing	325	5,778	3,067	9,170	1.00
128 Surface-coated paperboard manufactu	22	2,515	3,473	6,011	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

Industry	Direct*	Indirect*	Induced*	Total*	Deflator
129 Coated and laminated paper and packa	83,746	134,661	141,956	360,363	1.00
130 Coated and uncoated paper bag manuf	214	322	370	906	1.00
131 Die-cut paper office supplies manufac	411	137	423	971	1.00
132 Envelope manufacturing	101	202	265	568	1.00
133 Stationery and related product manufa	891	239	780	1,910	1.00
134 Sanitary paper product manufacturing	5,139	1,774	2,441	9,354	1.00
135 All other converted paper product man	964	2,183	3,039	6,187	1.00
136 Manifold business forms printing	9,367	35,576	77,926	122,869	1.00
137 Books printing	7	1,169	650	1,826	1.00
138 Blankbook and looseleaf binder manuf	60,739	16,223	54,011	130,973	1.00
139 Commercial printing	85,131	368,674	446,594	900,400	1.00
140 Tradebinding and related work	1,815	9,128	16,837	27,779	1.00
141 Prepress services	1,052	17,388	18,083	36,523	1.00
142 Petroleum refineries	0	0	0	0	1.00
143 Asphalt paving mixture and block man	0	112,977	370,286	483,263	1.00
144 Asphalt shingle and coating materials	0	229,974	315,596	545,570	1.00
145 Petroleum lubricating oil and grease	453,589	73,815	267,468	794,872	1.00
146 All other petroleum and coal products	8,209	1,756	5,772	15,737	1.00
147 Petrochemical manufacturing	1,599,089	2,583,919	2,178,537	6,361,545	1.00
148 Industrial gas manufacturing	33,329	381,756	197,773	612,858	1.00
149 Synthetic dye and pigment manufactur	515	118,954	110,559	230,028	1.00
150 Other basic inorganic chemical manufa	865	150,493	132,304	283,662	1.00
151 Other basic organic chemical manufac	26,683	552,879	340,728	920,289	1.00
152 Plastics material and resin manufactur	10,801	128,568	80,810	220,178	1.00
153 Synthetic rubber manufacturing	3,619	49,836	32,359	85,814	1.00
154 Cellulosic organic fiber manufacturing	0	1	14	14	1.00
155 Noncellulosic organic fiber manufactu	74	286	226	587	1.00
156 Nitrogenous fertilizer manufacturing	3,321	53,856	50,552	107,729	1.00
157 Phosphatic fertilizer manufacturing	0	0	0	0	1.00
158 Fertilizer- mixing only- manufacturing	8	62	78	148	1.00
159 Pesticide and other agricultural chemi	1,912	2,348	2,088	6,348	1.00
160 Pharmaceutical and medicine manufac	8,925,615	2,821,553	4,109,615	15,856,782	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
161 Paint and coating manufacturing	1,346	6,739	14,899	22,983	1.00
162 Adhesive manufacturing	89,302	148,583	200,874	438,760	1.00
163 Soap and other detergent manufacturin	1,635,380	263,987	756,044	2,655,411	1.00
164 Polish and other sanitation good manu	1,209,066	258,101	596,256	2,063,423	1.00
165 Surface active agent manufacturing	0	0	0	0	1.00
166 Toilet preparation manufacturing	2,341,313	305,702	915,388	3,562,403	1.00
167 Printing ink manufacturing	1	43,215	42,125	85,341	1.00
168 Explosives manufacturing	0	0	0	0	1.00
169 Custom compounding of purchased res	102	144,157	130,666	274,925	1.00
170 Photographic film and chemical manuf	78,526	165,147	298,131	541,805	1.00
171 Other miscellaneous chemical product	60,031	364,703	258,278	683,011	1.00
172 Plastics packaging materials- film and	268,710	377,609	439,363	1,085,682	1.00
173 Plastics pipe- fittings- and profile sha	15,627	546,522	455,882	1,018,031	1.00
174 Laminated plastics plate- sheet- and s	5,552	82,473	73,043	161,067	1.00
175 Plastics bottle manufacturing	1,235	345,674	139,132	486,041	1.00
176 Resilient floor covering manufacturing	2,862	21,397	38,449	62,708	1.00
177 Plastics plumbing fixtures and all othe	609,623	1,376,521	1,484,341	3,470,486	1.00
178 Foam product manufacturing	126,764	717,734	452,895	1,297,392	1.00
179 Tire manufacturing	261	53	479	793	1.00
180 Rubber and plastics hose and belting	2,859	8,963	9,986	21,808	1.00
181 Other rubber product manufacturing	13,961	23,529	28,377	65,868	1.00
182 Vitreous china plumbing fixture manuf	0	0	0	0	1.00
183 Vitreous china and earthenware articl	40,141	2,100	15,921	58,162	1.00
184 Porcelain electrical supply manufactur	0	0	0	0	1.00
185 Brick and structural clay tile manufac	0	0	0	0	1.00
186 Ceramic wall and floor tile manufactu	0	235	556	791	1.00
187 Nonclay refractory manufacturing	0	44	94	139	1.00
188 Clay refractory and other structural c	0	1	19	20	1.00
189 Glass container manufacturing	0	0	0	0	1.00
190 Glass and glass products- except glass	136,011	282,710	245,520	664,241	1.00
191 Cement manufacturing	0	0	0	0	1.00
192 Ready-mix concrete manufacturing	0	292	978	1,270	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
193 Concrete block and brick manufacturi	0	161	735	896	1.00
194 Concrete pipe manufacturing	0	24	55	80	1.00
195 Other concrete product manufacturing	1,016	221	2,755	3,992	1.00
196 Lime manufacturing	0	17	38	54	1.00
197 Gypsum product manufacturing	2	155	319	476	1.00
198 Abrasive product manufacturing	1,298	1,080	1,485	3,863	1.00
199 Cut stone and stone product manufac	34,562	2,256	87,839	124,657	1.00
200 Ground or treated minerals and earths	0	0	0	1	1.00
201 Mineral wool manufacturing	852	4,952	3,510	9,315	1.00
202 Miscellaneous nonmetallic mineral pr	9,421	903	4,693	15,017	1.00
203 Iron and steel mills	2,434	53,247	124,353	180,034	1.00
204 Ferroalloy and related product manufa	0	0	0	0	1.00
205 Iron- steel pipe and tube from purchas	151	7,385	17,081	24,618	1.00
206 Rolled steel shape manufacturing	665	17,533	40,726	58,923	1.00
207 Steel wire drawing	5,485	6,779	21,313	33,577	1.00
208 Alumina refining	0	0	0	0	1.00
209 Primary aluminum production	0	7	17	23	1.00
210 Secondary smelting and alloying of a	0	172	453	625	1.00
211 Aluminum sheet- plate- and foil manuf	9	1,866	2,900	4,775	1.00
212 Aluminum extruded product manufact	0	15	25	40	1.00
213 Other aluminum rolling and drawing	23	1,265	1,626	2,914	1.00
214 Primary smelting and refining of copp	0	0	0	0	1.00
215 Primary nonferrous metal- except cop	0	0	0	0	1.00
216 Copper rolling- drawing- and extrudin	30	1,394	3,598	5,023	1.00
217 Copper wire- except mechanical- draw	5,703	60,668	119,619	185,990	1.00
218 Secondary processing of copper	0	433	1,199	1,632	1.00
219 Nonferrous metal- except copper and	1,502	19,210	18,329	39,041	1.00
220 Secondary processing of other nonferr	35	33,419	28,620	62,074	1.00
221 Ferrous metal foundaries	2	159	558	719	1.00
222 Aluminum foundries	75	4,347	12,511	16,933	1.00
223 Nonferrous foundries- except alumin	27	1,593	4,620	6,240	1.00
224 Iron and steel forging	23	5,520	42,293	47,836	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
225 Nonferrous forging	0	1,687	9,104	10,791	1.00
226 Custom roll forming	7	2,547	5,181	7,735	1.00
227 All other forging and stamping	6,220	18,241	62,850	87,311	1.00
228 Cutlery and flatware- except precious	2,649	347	1,246	4,243	1.00
229 Hand and edge tool manufacturing	83,578	25,628	90,556	199,763	1.00
230 Saw blade and handsaw manufacturin	8,706	4,517	38,288	51,512	1.00
231 Kitchen utensil- pot- and pan manufac	256,827	31,707	103,930	392,464	1.00
232 Prefabricated metal buildings and co	230	1,134	4,855	6,218	1.00
233 Fabricated structural metal manufactu	0	2,495	7,971	10,466	1.00
234 Plate work manufacturing	0	10,529	12,911	23,440	1.00
235 Metal window and door manufacturing	702	3,114	5,668	9,483	1.00
236 Sheet metal work manufacturing	71	3,666	8,791	12,529	1.00
237 Ornamental and architectural metal w	15	4,466	8,772	13,252	1.00
238 Power boiler and heat exchanger manu	0	2,500	65,148	67,648	1.00
239 Metal tank- heavy gauge- manufacturi	0	278	2,430	2,708	1.00
240 Metal can- box- and other container m	5,281	36,306	34,044	75,631	1.00
241 Hardware manufacturing	1,292	2,735	5,649	9,676	1.00
242 Spring and wire product manufacturin	7,102	41,920	61,752	110,774	1.00
243 Machine shops	310	261,932	268,151	530,393	1.00
244 Turned product and screw- nut- and b	11,833	79,769	161,852	253,453	1.00
245 Metal heat treating	0	25,657	24,372	50,028	1.00
246 Metal coating and nonprecious engrav	153	38,566	33,780	72,498	1.00
247 Electroplating- anodizing- and colorin	0	84,304	88,472	172,777	1.00
248 Metal valve manufacturing	0	47,145	219,310	266,455	1.00
249 Ball and roller bearing manufacturing	0	13,650	26,508	40,158	1.00
250 Small arms manufacturing	0	0	0	0	1.00
251 Other ordnance and accessories manuf	0	0	0	0	1.00
252 Fabricated pipe and pipe fitting manuf	0	17,198	58,691	75,889	1.00
253 Industrial pattern manufacturing	0	539	10,347	10,886	1.00
254 Enameled iron and metal sanitary war	0	0	0	0	1.00
255 Miscellaneous fabricated metal produ	49	1,024	1,679	2,752	1.00
256 Ammunition manufacturing	44	1	24	70	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

Industry	Direct*	Indirect*	Induced*	Total*	Deflator
257 Farm machinery and equipment manufa	0	21,132	83,359	104,491	1.00
258 Lawn and garden equipment manufactu	130,506	54,557	1,096,576	1,281,638	1.00
259 Construction machinery manufacturin	938	10,329	101,327	112,594	1.00
260 Mining machinery and equipment manu	0	1,445	94,523	95,968	1.00
261 Oil and gas field machinery and equi	0	789	5,932	6,720	1.00
262 Sawmill and woodworking machinery	17,584	3,146	28,771	49,500	1.00
263 Plastics and rubber industry machiner	354	7,481	150,528	158,363	1.00
264 Paper industry machinery manufacturi	0	594	25,088	25,683	1.00
265 Textile machinery manufacturing	0	165	20,466	20,631	1.00
266 Printing machinery and equipment man	3	2,825	59,112	61,940	1.00
267 Food product machinery manufacturin	35	5,608	64,546	70,189	1.00
268 Semiconductor machinery manufacturi	0	0	0	0	1.00
269 All other industrial machinery manufa	19,175	14,952	533,815	567,943	1.00
270 Office machinery manufacturing	0	0	0	0	1.00
271 Optical instrument and lens manufactu	12,504	4,065	19,144	35,713	1.00
272 Photographic and photocopying equip	8,093	667	4,956	13,715	1.00
273 Other commercial and service industr	17	12,677	583,786	596,480	1.00
274 Automatic vending- commercial laund	37	7,442	6,808	14,287	1.00
275 Air purification equipment manufactur	19	84	584	686	1.00
276 Industrial and commercial fan and bl	13	86	259	359	1.00
277 Heating equipment- except warm air f	0	0	1	2	1.00
278 AC- refrigeration- and forced air heati	0	0	0	1	1.00
279 Industrial mold manufacturing	1,133	4,026	33,833	38,992	1.00
280 Metal cutting machine tool manufactur	1,229	948	194,659	196,836	1.00
281 Metal forming machine tool manufactu	20	120	3,842	3,982	1.00
282 Special tool- die- jig- and fixture man	387	12,498	992,355	1,005,241	1.00
283 Cutting tool and machine tool accesso	17	18,244	40,876	59,136	1.00
284 Rolling mill and other metalworking m	41	1,135	346,214	347,390	1.00
285 Turbine and turbine generator set unit	0	0	0	0	1.00
286 Other engine equipment manufacturin	27,696	80,588	130,603	238,888	1.00
287 Speed changers and mechanical power	992	37,259	156,370	194,621	1.00
288 Pump and pumping equipment manufac	0	649	2,660	3,308	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
289 Air and gas compressor manufacturin	0	8,669	6,646	15,314	1.00
290 Measuring and dispensing pump manuf	0	4	15	19	1.00
291 Elevator and moving stairway manufac	0	2,022	28,965	30,986	1.00
292 Conveyor and conveying equipment m	62	17,103	410,085	427,250	1.00
293 Overhead cranes- hoists- and monorai	0	3,780	165,948	169,728	1.00
294 Industrial truck- trailer- and stacker m	270	5,112	405,653	411,035	1.00
295 Power-driven handtool manufacturing	81,920	6,282	220,246	308,449	1.00
296 Welding and soldering equipment man	12,017	35,913	3,476,273	3,524,203	1.00
297 Packaging machinery manufacturing	0	5,648	286,483	292,131	1.00
298 Industrial process furnace and oven m	198	732	1,922	2,852	1.00
299 Fluid power cylinder and actuator man	2	277	1,659	1,938	1.00
300 Fluid power pump and motor manufact	51	321	3,308	3,680	1.00
301 Scales- balances- and miscellaneous g	7,356	31,107	225,112	263,575	1.00
302 Electronic computer manufacturing	1,625,196	118,349	889,189	2,632,733	1.00
303 Computer storage device manufacturi	58,283	115,376	125,711	299,370	1.00
304 Computer terminal manufacturing	4,244	33,749	43,661	81,654	1.00
305 Other computer peripheral equipment	66,815	11,551	50,031	128,397	1.00
306 Telephone apparatus manufacturing	79,055	30,461	1,493,163	1,602,678	1.00
307 Broadcast and wireless communicatio	66,040	26,891	406,504	499,435	1.00
308 Other communications equipment manu	251	21,817	99,876	121,944	1.00
309 Audio and video equipment manufactu	43,430	1,030	15,619	60,079	1.00
310 Electron tube manufacturing	197	5,736	11,416	17,349	1.00
311 Semiconductors and related device ma	56	23,134	36,270	59,460	1.00
312 All other electronic component manufa	86,108	205,144	381,230	672,482	1.00
313 Electromedical apparatus manufacturi	73,605	411,700	707,154	1,192,459	1.00
314 Search- detection- and navigation inst	74	34	963	1,071	1.00
315 Automatic environmental control manu	0	9,132	20,845	29,977	1.00
316 Industrial process variable instrument	1,783	33,904	315,106	350,792	1.00
317 Totalizing fluid meters and counting d	0	3,097	3,119	6,217	1.00
318 Electricity and signal testing instrumen	2,768	14,810	195,394	212,973	1.00
319 Analytical laboratory instrument manu	955	1,095	1,639	3,689	1.00
320 Irradiation apparatus manufacturing	1,008	35,211	324,465	360,684	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
321 Watch- clock- and other measuring and	42,423	4,258	49,348	96,029	1.00
322 Software reproducing	0	53,861	58,798	112,658	1.00
323 Audio and video media reproduction	23	3,293	2,485	5,801	1.00
324 Magnetic and optical recording media	802	1,192	1,100	3,095	1.00
325 Electric lamp bulb and part manufactu	64	26	58	148	1.00
326 Lighting fixture manufacturing	201	99	345	645	1.00
327 Electric housewares and household fa	11,052	392	4,278	15,722	1.00
328 Household vacuum cleaner manufactu	364,115	3,361	256,109	623,585	1.00
329 Household cooking appliance manufac	0	0	0	0	1.00
330 Household refrigerator and home free	0	0	0	0	1.00
331 Household laundry equipment manufac	58	0	20	79	1.00
332 Other major household appliance manu	0	0	0	0	1.00
333 Electric power and specialty transfor	213	4,266	6,745	11,223	1.00
334 Motor and generator manufacturing	2,793	14,867	43,017	60,677	1.00
335 Switchgear and switchboard apparatus	4,938	60,445	185,684	251,067	1.00
336 Relay and industrial control manufactu	696	31,361	129,391	161,448	1.00
337 Storage battery manufacturing	16,489	5,721	10,888	33,097	1.00
338 Primary battery manufacturing	1,368	26	479	1,873	1.00
339 Fiber optic cable manufacturing	682	11,727	13,312	25,720	1.00
340 Other communication and energy wire	249	56,534	90,241	147,024	1.00
341 Wiring device manufacturing	498	4,305	8,554	13,357	1.00
342 Carbon and graphite product manufact	1,568	5,658	11,131	18,356	1.00
343 Miscellaneous electrical equipment m	29,901	10,595	121,040	161,536	1.00
344 Automobile and light truck manufactu	8,171,646	9,439	6,567,084	14,748,168	1.00
345 Heavy duty truck manufacturing	0	0	0	0	1.00
346 Motor vehicle body manufacturing	4,996	23,680	42,254	70,930	1.00
347 Truck trailer manufacturing	14	2,107	270,549	272,671	1.00
348 Motor home manufacturing	0	0	0	0	1.00
349 Travel trailer and camper manufacturi	79,915	1,455	33,946	115,316	1.00
350 Motor vehicle parts manufacturing	613,061	1,153,934	1,251,625	3,018,620	1.00
351 Aircraft manufacturing	9,864	2,985	18,268	31,116	1.00
352 Aircraft engine and engine parts manu	865	102,468	344,708	448,042	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

Industry	Direct*	Indirect*	Induced*	Total*	Deflator
353 Other aircraft parts and equipment	3,965	3,714	110,603	118,283	1.00
354 Guided missile and space vehicle man	0	0	0	0	1.00
355 Propulsion units and parts for space v	0	0	0	0	1.00
356 Railroad rolling stock manufacturing	124	-31	1,295	1,388	1.00
357 Ship building and repairing	0	-125	143	18	1.00
358 Boat building	8,958	24	3,773	12,756	1.00
359 Motorcycle- bicycle- and parts manufa	90,593	11,576	40,204	142,373	1.00
360 Military armored vehicles and tank pa	4,685	5	4,114	8,804	1.00
361 All other transportation equipment ma	3,347	343	1,714	5,404	1.00
362 Wood kitchen cabinet and countertop	121,343	372,173	941,879	1,435,394	1.00
363 Upholstered household furniture manu	59,637	41	21,917	81,596	1.00
364 Nonupholstered wood household furni	463,947	4,288	182,853	651,087	1.00
365 Metal household furniture manufactur	28,752	131	11,652	40,535	1.00
366 Institutional furniture manufacturing	4,429	1,100	17,345	22,874	1.00
367 Other household and institutional furni	7,453	893	3,893	12,239	1.00
368 Wood office furniture manufacturing	6,470	94	77,390	83,954	1.00
369 Custom architectural woodwork and m	0	5,625	122,675	128,300	1.00
370 Office furniture- except wood- manufa	171	53	28,407	28,631	1.00
371 Showcases- partitions- shelving- and l	1,018	15,862	522,510	539,390	1.00
372 Mattress manufacturing	666,654	361	368,852	1,035,867	1.00
373 Blind and shade manufacturing	93,184	215	34,951	128,350	1.00
374 Laboratory apparatus and furniture ma	6,332	13,402	431,738	451,472	1.00
375 Surgical and medical instrument manu	49,214	790,031	889,262	1,728,508	1.00
376 Surgical appliance and supplies manuf	568,411	847,047	1,110,839	2,526,296	1.00
377 Dental equipment and supplies manufa	2,766	223,765	242,519	469,050	1.00
378 Ophthalmic goods manufacturing	253,766	3,752	86,538	344,056	1.00
379 Dental laboratories	0	495,893	170,844	666,736	1.00
380 Jewelry and silverware manufacturing	125,101	2,775	48,405	176,281	1.00
381 Sporting and athletic goods manufactu	11,647	803	5,219	17,670	1.00
382 Doll- toy- and game manufacturing	1,797,747	80,089	674,774	2,552,609	1.00
383 Office supplies- except paper- manufa	15,332	2,250	7,988	25,570	1.00
384 Sign manufacturing	769	51,501	109,344	161,614	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

Industry	Direct*	Indirect*	Induced*	Total*	Deflator
385 Gasket- packing- and sealing device	1,200	4,312	7,176	12,688	1.00
386 Musical instrument manufacturing	211,851	12,432	125,536	349,819	1.00
387 Broom- brush- and mop manufacturing	23,596	10,095	22,165	55,856	1.00
388 Burial casket manufacturing	0	455	139	594	1.00
389 Buttons- pins- and all other miscella	25,546	13,376	23,760	62,681	1.00
390 Wholesale trade	-28,474,368	931,076	2,775,709	-24,767,584	1.00
391 Air transportation	1,009,602	225,725	567,466	1,802,792	1.00
392 Rail transportation	-3,727,362	1,778,879	631,279	-1,317,204	1.00
393 Water transportation	-2,244,883	231,856	642,725	-1,370,302	1.00
394 Truck transportation	-1,568,969	2,644,696	5,763,052	6,838,778	1.00
395 Transit and ground passenger transpor	324,740	69,639	197,196	591,575	1.00
396 Pipeline transportation	-1,210,809	1,076,737	126,075	-7,997	1.00
397 Scenic and sightseeing transportation	285,147	-56,621	629,041	857,566	1.00
398 Postal service	689,855	1,435,535	1,309,197	3,434,586	1.00
399 Couriers and messengers	0	547,593	739,270	1,286,863	1.00
400 Warehousing and storage	58,560	202,131	579,730	840,421	1.00
401 Motor vehicle and parts dealers	21,058,390	446,986	8,165,293	29,670,668	1.00
402 Furniture and home furnishings stores	4,824,579	125,275	1,894,931	6,844,784	1.00
403 Electronics and appliance stores	2,948,471	88,296	1,250,327	4,287,094	1.00
404 Building material and garden supply s	10,388,241	264,024	4,095,921	14,748,186	1.00
405 Food and beverage stores	16,744,938	358,478	6,535,388	23,638,804	1.00
406 Health and personal care stores	7,465,080	195,716	2,952,907	10,613,703	1.00
407 Gasoline stations	-184,590,192	160,560	2,522,012	-181,907,616	1.00
408 Clothing and clothing accessories stor	9,240,763	183,170	3,532,926	12,956,858	1.00
409 Sporting goods- hobby- book and musi	3,566,331	81,272	1,426,843	5,074,446	1.00
410 General merchandise stores	13,655,006	292,025	5,251,443	19,198,474	1.00
411 Miscellaneous store retailers	5,285,878	112,997	2,074,020	7,472,894	1.00
412 Nonstore retailers	10,637,361	265,867	4,145,150	15,048,378	1.00
413 Newspaper publishers	375,276	359,464	650,620	1,385,361	1.00
414 Periodical publishers	361,793	226,865	385,161	973,819	1.00
415 Book publishers	503,561	119,910	313,064	936,535	1.00
416 Database- directory- and other publish	296,249	413,690	611,168	1,321,108	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
417 Software publishers	517,895	28,268	369,050	915,213	1.00
418 Motion picture and video industries	818,133	740,061	640,152	2,198,346	1.00
419 Sound recording industries	319,276	49,591	128,524	497,390	1.00
420 Radio and television broadcasting	248,386	395,739	544,738	1,188,862	1.00
421 Cable networks and program distribut	285,237	13,375	110,301	408,913	1.00
422 Telecommunications	9,101,981	3,751,479	6,374,279	19,227,738	1.00
423 Information services	203,188	155,160	204,539	562,887	1.00
424 Data processing services	7,193	228,041	251,395	486,629	1.00
425 Nondepository credit intermediation an	2,822,028	2,654,854	3,076,331	8,553,212	1.00
426 Securities- commodity contracts- inve	5,545,972	6,733,250	5,074,899	17,354,120	1.00
427 Insurance carriers	16,728,844	4,267,768	8,027,169	29,023,780	1.00
428 Insurance agencies- brokerages- and r	0	4,605,749	1,760,280	6,366,029	1.00
429 Funds- trusts- and other financial vehi	5,141,768	116,300	1,958,469	7,216,536	1.00
430 Monetary authorities and depository c	19,198,940	3,093,968	8,583,014	30,875,922	1.00
431 Real estate	23,914,842	18,604,314	21,226,320	63,745,476	1.00
432 Automotive equipment rental and leas	1,984,643	409,624	1,076,299	3,470,567	1.00
433 Video tape and disc rental	599,469	786	214,366	814,621	1.00
434 Machinery and equipment rental and l	12,626	558,958	651,308	1,222,892	1.00
435 General and consumer goods rental ex	303,665	96,166	268,325	668,157	1.00
436 Lessors of nonfinancial intangible asse	0	1,749,921	709,064	2,458,986	1.00
437 Legal services	6,123,104	5,377,909	4,915,298	16,416,310	1.00
438 Accounting and bookkeeping services	418,897	2,600,192	2,476,798	5,495,888	1.00
439 Architectural and engineering services	3,033	2,634,501	4,219,689	6,857,224	1.00
440 Specialized design services	55,412	378,429	374,746	808,587	1.00
441 Custom computer programming servic	11,510	86,104	3,382,923	3,480,537	1.00
442 Computer systems design services	58,220	640,161	973,247	1,671,628	1.00
443 Other computer related services- includ	46,472	398,147	529,492	974,111	1.00
444 Management consulting services	66,687	2,448,288	2,094,287	4,609,262	1.00
445 Environmental and other technical cons	88	665,823	581,754	1,247,664	1.00
446 Scientific research and development s	983,691	957,776	1,447,810	3,389,278	1.00
447 Advertising and related services	11,052	843,851	1,227,891	2,082,795	1.00
448 Photographic services	524,530	94,553	239,459	858,543	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

Industry	Direct*	Indirect*	Induced*	Total*	Deflator
449 Veterinary services	2,725,927	131,832	1,024,731	3,882,490	1.00
450 All other miscellaneous professional a	0	1,844,138	1,238,565	3,082,703	1.00
451 Management of companies and enterpr	0	1,849,943	4,074,565	5,924,508	1.00
452 Office administrative services	2,007	1,960,089	1,438,285	3,400,380	1.00
453 Facilities support services	25	72,734	203,041	275,800	1.00
454 Employment services	73,059	2,791,108	2,046,680	4,910,847	1.00
455 Business support services	329,193	1,337,561	955,310	2,622,065	1.00
456 Travel arrangement and reservation se	807,737	256,124	470,469	1,534,330	1.00
457 Investigation and security services	69,783	582,882	989,239	1,641,904	1.00
458 Services to buildings and dwellings	776,661	2,677,500	2,182,789	5,636,950	1.00
459 Other support services	46,700	609,554	566,269	1,222,523	1.00
460 Waste management and remediation se	258,756	887,554	876,469	2,022,778	1.00
461 Elementary and secondary schools	3,608,717	0	1,422,184	5,030,901	1.00
462 Colleges- universities- and junior coll	8,541,035	298,868	3,293,132	12,133,035	1.00
463 Other educational services	3,688,629	318,086	1,511,079	5,517,795	1.00
464 Home health care services	6,606,776	0	2,253,286	8,860,062	1.00
465 Offices of physicians- dentists- and ot	49,285,456	0	16,563,689	65,849,144	1.00
466 Other ambulatory health care services	13,249,296	935,733	4,971,602	19,156,630	1.00
467 Hospitals	57,326,732	0	19,314,382	76,641,112	1.00
468 Nursing and residential care facilities	14,808,235	0	5,045,998	19,854,232	1.00
469 Child day care services	5,469,862	0	2,001,185	7,471,047	1.00
470 Social assistance- except child day ca	8,068,709	191	2,937,130	11,006,030	1.00
471 Performing arts companies	638,990	349,969	362,596	1,351,555	1.00
472 Spectator sports	1,250,901	442,641	692,045	2,385,588	1.00
473 Independent artists- writers- and perf	2,953	143,534	75,921	222,408	1.00
474 Promoters of performing arts and spor	719,877	228,629	386,047	1,334,553	1.00
475 Museums- historical sites- zoos- and	870,858	0	304,603	1,175,460	1.00
476 Fitness and recreational sports centers	1,562,688	72,190	594,889	2,229,767	1.00
477 Bowling centers	394,844	28,012	157,363	580,220	1.00
478 Other amusement- gambling- and recrea	5,822,065	55,887	2,114,448	7,992,399	1.00
479 Hotels and motels- including casino ho	2,797,720	888,710	1,790,119	5,476,549	1.00
480 Other accommodations	465,595	4,819	173,540	643,955	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
 IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
481 Food services and drinking places	40,450,940	2,730,940	15,625,256	58,807,136	1.00
482 Car washes	888,536	53,910	361,237	1,303,683	1.00
483 Automotive repair and maintenance- e	7,214,787	452,909	3,142,804	10,810,499	1.00
484 Electronic equipment repair and main	124,468	113,408	612,222	850,099	1.00
485 Commercial machinery repair and mai	0	365,176	457,439	822,615	1.00
486 Household goods repair and maintena	816,371	208,620	544,924	1,569,914	1.00
487 Personal care services	5,109,465	159,292	1,778,709	7,047,466	1.00
488 Death care services	1,578,135	0	479,271	2,057,406	1.00
489 Drycleaning and laundry services	1,384,545	424,350	804,228	2,613,123	1.00
490 Other personal services	5,583,578	124,333	2,162,317	7,870,227	1.00
491 Religious organizations	2,487,292	0	866,375	3,353,667	1.00
492 Grantmaking and giving and social ad	2,889,358	0	1,053,203	3,942,561	1.00
493 Civic- social- professional and similar	3,860,962	1,557,783	2,130,602	7,549,346	1.00
494 Private households	1,796,120	0	645,133	2,441,253	1.00
495 Federal electric utilities	0	0	0	0	1.00
496 Other Federal Government enterprises	2,502	3,813	5,836	12,151	1.00
497 State and local government passenger t	860,319	184,492	522,421	1,567,233	1.00
498 State and local government electric uti	30,446,156	326,018	1,033,253	31,805,428	1.00
499 Other State and local government ente	8,144,405	1,926,395	4,081,721	14,152,520	1.00
500 Noncomparable imports	0	0	0	0	1.00
501 Scrap	0	0	0	0	1.00
502 Used and secondhand goods	0	0	0	0	1.00
503 State & Local Education	0	0	25,063,336	25,063,336	1.00
504 State & Local Non-Education	0	0	20,326,848	20,326,848	1.00
505 Federal Military	0	0	2,571,350	2,571,350	1.00
506 Federal Non-Military	0	0	11,176,706	11,176,706	1.00
507 Rest of the world adjustment to final	0	0	0	0	1.00
508 Inventory valuation adjustment	0	0	0	0	1.00
509 Owner-occupied dwellings	115,272,264	0	41,166,676	156,438,944	1.00

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)



Output Impact

September 24, 2008

Copyright MIG 2008

Cleveland EV 2008 090908.iap
IMPACT NAME: B 2008defl Petrol Displace w Refine MULTIPLIER: Type

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>	<u>Deflator</u>
11001 Federal Government NonDefense	16,855	0	0	16,855	1.00
11003 Federal Government Investment	16,512	0	0	16,512	1.00
12001 State/Local Govt NonEducation	22,815,328	0	0	22,815,328	1.00
12003 State/Local Govt Investment	253,255	0	0	253,255	1.00
14001 Capital	1,967,537	0	0	1,967,537	1.00
14002 Inventory Additions/Deletions	50,063	0	0	50,063	1.00
25001 Foreign Trade	68,263,224	0	0	68,263,224	1.00
28001 Domestic Trade	15,970,101	0	0	15,970,101	1.00
Total	743,505,261	160,257,418	479,299,180	1,383,061,864	

*2006 Dollars - if results are deflated and aggregated, then deflators displayed are set to 1.0 (results have been deflated)

Version:2.0.1025

Report IM010



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2008defl Petrol Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type S

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
1 Oilseed farming	0.0	0.0	0.0	0.1
2 Grain farming	0.1	0.1	0.1	0.4
3 Vegetable and melon farming	1.2	0.0	0.4	1.7
4 Tree nut farming	0.0	0.0	0.0	0.0
5 Fruit farming	0.7	0.0	0.3	1.1
6 Greenhouse and nursery production	7.9	1.9	4.3	14.1
7 Tobacco farming	0.0	0.0	0.0	0.0
8 Cotton farming	0.0	0.0	0.0	0.0
9 Sugarcane and sugar beet farming	0.0	0.0	0.0	0.0
10 All other crop farming	0.0	0.2	0.1	0.4
11 Cattle ranching and farming	0.2	6.4	2.5	9.1
12 Poultry and egg production	0.1	0.0	0.0	0.2
13 Animal production- except cattle and	2.8	1.5	1.5	5.8
14 Logging	0.0	0.0	0.1	0.2
15 Forest nurseries- forest products- and	0.0	0.0	0.0	0.0
16 Fishing	0.0	0.0	0.0	0.0
17 Hunting and trapping	0.3	0.0	0.1	0.4
18 Agriculture and forestry support activi	0.1	0.2	0.1	0.4
19 Oil and gas extraction	1.2	62.3	6.9	70.3
20 Coal mining	0.0	0.0	0.0	0.1
21 Iron ore mining	0.0	0.0	0.0	0.0
22 Copper- nickel- lead- and zinc mining	0.0	0.0	0.0	0.0
23 Gold- silver- and other metal ore mini	0.0	0.0	0.0	0.0
24 Stone mining and quarrying	0.0	0.0	0.0	0.0
25 Sand- gravel- clay- and refractory min	0.0	0.0	0.0	0.0
26 Other nonmetallic mineral mining	0.0	0.1	0.1	0.2
27 Drilling oil and gas wells	0.0	0.0	0.3	0.3
28 Support activities for oil and gas oper	0.0	0.6	0.4	1.0
29 Support activities for other mining	0.0	0.0	0.0	0.0
30 Power generation and supply	351.6	4.1	12.9	368.6
31 Natural gas distribution	5.0	0.8	2.4	8.2
32 Water- sewage and other systems	2.8	0.9	1.4	5.1
33 New residential 1-unit structures- all	0.0	0.0	118.1	118.1
34 New multifamily housing structures- a	0.0	0.0	18.6	18.6
35 New residential additions and alteratio	0.0	0.0	26.6	26.6
36 New farm housing units	0.0	0.0	0.0	0.0
37 Manufacturing and industrial building	0.0	0.0	22.0	22.0
38 Commercial and institutional building	0.0	0.0	124.3	124.3
39 Highway- street- bridge- and tunnel co	0.0	0.0	23.3	23.3
40 Water- sewer- and pipeline constructi	0.0	0.0	12.8	12.8
41 Other new construction	0.0	0.0	36.3	36.3
42 Maintenance and repair of farm and n	0.0	5.9	8.5	14.4
43 Maintenance and repair of nonresidenti	0.0	20.3	15.1	35.4
44 Maintenance and repair of highways- st	0.0	0.0	10.8	10.8
45 Other maintenance and repair construc	0.0	39.2	5.7	44.9
46 Dog and cat food manufacturing	0.0	0.0	0.0	0.0
47 Other animal food manufacturing	0.0	0.0	0.0	0.0
48 Flour milling	0.1	0.0	0.0	0.1
49 Rice milling	0.0	0.0	0.0	0.0
50 Malt manufacturing	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2008defl Petrol Displace w Refine
Cleveland EV 2008 090908.iap MULTIPLIER: Type S

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
51 Wet corn milling	0.0	0.0	0.0	0.0
52 Soybean processing	0.0	0.0	0.0	0.0
53 Other oilseed processing	0.0	0.0	0.0	0.0
54 Fats and oils refining and blending	0.0	0.0	0.0	0.0
55 Breakfast cereal manufacturing	0.0	0.0	0.0	0.0
56 Sugar manufacturing	0.0	0.0	0.0	0.1
57 Confectionery manufacturing from ca	0.0	0.0	0.0	0.0
58 Confectionery manufacturing from pu	0.1	0.0	0.1	0.2
59 Nonchocolate confectionery manufact	0.1	0.0	0.0	0.1
60 Frozen food manufacturing	0.3	0.1	0.1	0.6
61 Fruit and vegetable canning and dryin	0.1	0.0	0.0	0.2
62 Fluid milk manufacturing	2.9	1.0	1.6	5.4
63 Creamery butter manufacturing	0.0	0.0	0.0	0.0
64 Cheese manufacturing	1.4	0.9	0.8	3.1
65 Dry- condensed- and evaporated dairy	0.0	0.0	0.0	0.0
66 Ice cream and frozen dessert manufact	0.1	0.2	0.1	0.4
67 Animal- except poultry- slaughtering	0.1	0.0	0.0	0.1
68 Meat processed from carcasses	0.5	0.2	0.2	1.0
69 Rendering and meat byproduct proces	0.0	0.0	0.0	0.0
70 Poultry processing	1.1	0.3	0.5	1.9
71 Seafood product preparation and pack	0.0	0.0	0.0	0.0
72 Frozen cakes and other pastries manuf	0.8	0.2	0.4	1.4
73 Bread and bakery product- except fro	14.3	4.3	6.9	25.5
74 Cookie and cracker manufacturing	0.7	0.1	0.3	1.0
75 Mixes and dough made from purchased	1.7	0.2	0.7	2.6
76 Dry pasta manufacturing	0.0	0.0	0.0	0.0
77 Tortilla manufacturing	0.1	0.0	0.0	0.1
78 Roasted nuts and peanut butter manufa	0.1	0.0	0.1	0.2
79 Other snack food manufacturing	1.1	0.4	0.5	2.0
80 Coffee and tea manufacturing	0.0	0.0	0.0	0.0
81 Flavoring syrup and concentrate manu	0.0	0.1	0.0	0.1
82 Mayonnaise- dressing- and sauce manu	0.5	0.2	0.3	1.0
83 Spice and extract manufacturing	0.8	0.3	0.4	1.6
84 All other food manufacturing	2.2	0.2	0.8	3.3
85 Soft drink and ice manufacturing	0.5	0.1	0.2	0.8
86 Breweries	0.0	0.0	0.0	0.0
87 Wineries	0.1	0.0	0.0	0.1
88 Distilleries	0.0	0.0	0.0	0.1
89 Tobacco stemming and redrying	0.0	0.0	0.0	0.0
90 Cigarette manufacturing	0.0	0.0	0.0	0.0
91 Other tobacco product manufacturing	0.0	0.0	0.0	0.0
92 Fiber- yarn- and thread mills	0.0	0.0	0.0	0.0
93 Broadwoven fabric mills	0.0	0.0	0.0	0.0
94 Narrow fabric mills and schiffli embro	0.0	0.0	0.0	0.0
95 Nonwoven fabric mills	0.0	0.0	0.0	0.0
96 Knit fabric mills	0.0	0.0	0.0	0.0
97 Textile and fabric finishing mills	0.0	0.0	0.0	0.1
98 Fabric coating mills	0.0	0.0	0.0	0.0
99 Carpet and rug mills	0.0	0.0	0.0	0.0
100 Curtain and linen mills	1.0	0.1	0.4	1.4

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2008defl Petrol Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type S

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
101 Textile bag and canvas mills	0.1	0.0	0.0	0.1
102 Tire cord and tire fabric mills	0.0	0.0	0.0	0.0
103 Other miscellaneous textile product mi	0.0	0.0	0.0	0.1
104 Sheer hosiery mills	0.0	0.0	0.0	0.0
105 Other hosiery and sock mills	0.0	0.0	0.0	0.0
106 Other apparel knitting mills	0.0	0.0	0.0	0.0
107 Cut and sew apparel manufacturing	12.0	0.2	4.4	16.6
108 Accessories and other apparel manufa	0.0	0.0	0.0	0.1
109 Leather and hide tanning and finishing	0.0	0.0	0.0	0.0
110 Footwear manufacturing	0.6	0.0	0.2	0.8
111 Other leather product manufacturing	0.3	0.0	0.1	0.5
112 Sawmills	0.0	0.1	0.2	0.3
113 Wood preservation	0.0	0.0	0.0	0.1
114 Reconstituted wood product manufact	0.0	0.0	0.0	0.0
115 Veneer and plywood manufacturing	0.0	0.0	0.0	0.0
116 Engineered wood member and truss ma	0.0	0.3	0.6	0.9
117 Wood windows and door manufacturi	0.0	0.5	1.1	1.6
118 Cut stock- resawing lumber- and plani	0.0	0.0	0.0	0.0
119 Other millwork- including flooring	0.0	1.0	2.1	3.2
120 Wood container and pallet manufactur	0.5	-0.6	0.8	0.7
121 Manufactured home- mobile home- ma	0.0	0.0	0.0	0.0
122 Prefabricated wood building manufact	0.0	0.0	0.0	0.0
123 Miscellaneous wood product manufact	0.2	0.1	0.2	0.5
124 Pulp mills	0.0	0.0	0.0	0.0
125 Paper and paperboard mills	0.0	0.0	0.0	0.0
126 Paperboard container manufacturing	0.0	0.1	0.1	0.2
127 Flexible packaging foil manufacturing	0.0	0.0	0.0	0.0
128 Surface-coated paperboard manufactu	0.0	0.0	0.0	0.0
129 Coated and laminated paper and packa	0.2	0.3	0.4	0.9
130 Coated and uncoated paper bag manuf	0.0	0.0	0.0	0.0
131 Die-cut paper office supplies manufac	0.0	0.0	0.0	0.0
132 Envelope manufacturing	0.0	0.0	0.0	0.0
133 Stationery and related product manufa	0.0	0.0	0.0	0.0
134 Sanitary paper product manufacturing	0.0	0.0	0.0	0.0
135 All other converted paper product man	0.0	0.0	0.0	0.0
136 Manifold business forms printing	0.0	0.1	0.3	0.4
137 Books printing	0.0	0.0	0.0	0.0
138 Blankbook and looseleaf binder manuf	0.4	0.1	0.4	0.9
139 Commercial printing	1.2	5.2	6.4	12.8
140 Tradebinding and related work	0.0	0.1	0.2	0.4
141 Prepress services	0.0	0.1	0.1	0.2
142 Petroleum refineries	0.0	0.0	0.0	0.0
143 Asphalt paving mixture and block man	0.0	0.2	0.5	0.7
144 Asphalt shingle and coating materials	0.0	0.3	0.4	0.8
145 Petroleum lubricating oil and grease	0.4	0.1	0.2	0.7
146 All other petroleum and coal products	0.0	0.0	0.0	0.0
147 Petrochemical manufacturing	0.2	0.3	0.3	0.8
148 Industrial gas manufacturing	0.0	0.4	0.2	0.7
149 Synthetic dye and pigment manufactur	0.0	0.2	0.2	0.4
150 Other basic inorganic chemical manufa	0.0	0.3	0.3	0.6

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2008defl Petrol Displace w Refine
Cleveland EV 2008 090908.iap MULTIPLIER: Type S

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
151 Other basic organic chemical manufac	0.0	0.5	0.3	0.8
152 Plastics material and resin manufactur	0.0	0.1	0.1	0.2
153 Synthetic rubber manufacturing	0.0	0.1	0.0	0.1
154 Cellulosic organic fiber manufacturing	0.0	0.0	0.0	0.0
155 Noncellulosic organic fiber manufactu	0.0	0.0	0.0	0.0
156 Nitrogenous fertilizer manufacturing	0.0	0.0	0.0	0.1
157 Phosphatic fertilizer manufacturing	0.0	0.0	0.0	0.0
158 Fertilizer- mixing only- manufacturing	0.0	0.0	0.0	0.0
159 Pesticide and other agricultural chemi	0.0	0.0	0.0	0.0
160 Pharmaceutical and medicine manufac	10.7	3.4	4.9	19.1
161 Paint and coating manufacturing	0.0	0.0	0.0	0.0
162 Adhesive manufacturing	0.2	0.3	0.4	0.9
163 Soap and other detergent manufacturin	1.8	0.3	0.8	2.9
164 Polish and other sanitation good manu	1.2	0.3	0.6	2.1
165 Surface active agent manufacturing	0.0	0.0	0.0	0.0
166 Toilet preparation manufacturing	3.3	0.4	1.3	5.1
167 Printing ink manufacturing	0.0	0.1	0.1	0.2
168 Explosives manufacturing	0.0	0.0	0.0	0.0
169 Custom compounding of purchased res	0.0	0.3	0.3	0.6
170 Photographic film and chemical manuf	0.2	0.4	0.7	1.3
171 Other miscellaneous chemical product	0.1	0.7	0.5	1.3
172 Plastics packaging materials- film and	0.8	1.1	1.3	3.2
173 Plastics pipe- fittings- and profile sha	0.0	1.5	1.3	2.8
174 Laminated plastics plate- sheet- and s	0.0	0.3	0.3	0.7
175 Plastics bottle manufacturing	0.0	1.1	0.4	1.6
176 Resilient floor covering manufacturing	0.0	0.1	0.1	0.2
177 Plastics plumbing fixtures and all othe	3.1	6.9	7.4	17.4
178 Foam product manufacturing	0.5	2.6	1.6	4.6
179 Tire manufacturing	0.0	0.0	0.0	0.0
180 Rubber and plastics hose and belting	0.0	0.0	0.0	0.1
181 Other rubber product manufacturing	0.1	0.1	0.1	0.3
182 Vitreous china plumbing fixture manuf	0.0	0.0	0.0	0.0
183 Vitreous china and earthenware articl	0.4	0.0	0.2	0.6
184 Porcelain electrical supply manufactur	0.0	0.0	0.0	0.0
185 Brick and structural clay tile manufac	0.0	0.0	0.0	0.0
186 Ceramic wall and floor tile manufactu	0.0	0.0	0.0	0.0
187 Nonclay refractory manufacturing	0.0	0.0	0.0	0.0
188 Clay refractory and other structural c	0.0	0.0	0.0	0.0
189 Glass container manufacturing	0.0	0.0	0.0	0.0
190 Glass and glass products- except glass	0.6	1.2	1.0	2.8
191 Cement manufacturing	0.0	0.0	0.0	0.0
192 Ready-mix concrete manufacturing	0.0	0.0	0.0	0.0
193 Concrete block and brick manufacturi	0.0	0.0	0.0	0.0
194 Concrete pipe manufacturing	0.0	0.0	0.0	0.0
195 Other concrete product manufacturing	0.0	0.0	0.0	0.0
196 Lime manufacturing	0.0	0.0	0.0	0.0
197 Gypsum product manufacturing	0.0	0.0	0.0	0.0
198 Abrasive product manufacturing	0.0	0.0	0.0	0.0
199 Cut stone and stone product manufact	0.4	0.0	0.9	1.3
200 Ground or treated minerals and earths	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2008defl Petrol Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type S

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
201 Mineral wool manufacturing	0.0	0.0	0.0	0.0
202 Miscellaneous nonmetallic mineral pr	0.0	0.0	0.0	0.1
203 Iron and steel mills	0.0	0.1	0.1	0.2
204 Ferroalloy and related product manufa	0.0	0.0	0.0	0.0
205 Iron- steel pipe and tube from purchas	0.0	0.0	0.0	0.0
206 Rolled steel shape manufacturing	0.0	0.0	0.1	0.1
207 Steel wire drawing	0.0	0.0	0.1	0.1
208 Alumina refining	0.0	0.0	0.0	0.0
209 Primary aluminum production	0.0	0.0	0.0	0.0
210 Secondary smelting and alloying of a	0.0	0.0	0.0	0.0
211 Aluminum sheet- plate- and foil manuf	0.0	0.0	0.0	0.0
212 Aluminum extruded product manufact	0.0	0.0	0.0	0.0
213 Other aluminum rolling and drawing	0.0	0.0	0.0	0.0
214 Primary smelting and refining of copp	0.0	0.0	0.0	0.0
215 Primary nonferrous metal- except cop	0.0	0.0	0.0	0.0
216 Copper rolling- drawing- and extrudin	0.0	0.0	0.0	0.0
217 Copper wire- except mechanical- draw	0.0	0.1	0.1	0.2
218 Secondary processing of copper	0.0	0.0	0.0	0.0
219 Nonferrous metal- except copper and	0.0	0.0	0.0	0.1
220 Secondary processing of other nonferr	0.0	0.1	0.1	0.1
221 Ferrous metal foundaries	0.0	0.0	0.0	0.0
222 Aluminum foundries	0.0	0.0	0.1	0.1
223 Nonferrous foundries- except alumin	0.0	0.0	0.0	0.0
224 Iron and steel forging	0.0	0.0	0.2	0.2
225 Nonferrous forging	0.0	0.0	0.0	0.0
226 Custom roll forming	0.0	0.0	0.0	0.0
227 All other forging and stamping	0.0	0.1	0.3	0.4
228 Cutlery and flatware- except precious	0.0	0.0	0.0	0.0
229 Hand and edge tool manufacturing	0.4	0.1	0.4	0.9
230 Saw blade and handsaw manufacturin	0.0	0.0	0.2	0.3
231 Kitchen utensil- pot- and pan manufac	1.4	0.2	0.5	2.1
232 Prefabricated metal buildings and co	0.0	0.0	0.0	0.0
233 Fabricated structural metal manufactu	0.0	0.0	0.0	0.0
234 Plate work manufacturing	0.0	0.0	0.0	0.1
235 Metal window and door manufacturing	0.0	0.0	0.0	0.1
236 Sheet metal work manufacturing	0.0	0.0	0.0	0.1
237 Ornamental and architectural metal w	0.0	0.0	0.0	0.1
238 Power boiler and heat exchanger manu	0.0	0.0	0.2	0.2
239 Metal tank- heavy gauge- manufacturi	0.0	0.0	0.0	0.0
240 Metal can- box- and other container m	0.0	0.1	0.1	0.2
241 Hardware manufacturing	0.0	0.0	0.0	0.0
242 Spring and wire product manufacturin	0.0	0.2	0.3	0.5
243 Machine shops	0.0	2.0	2.0	4.0
244 Turned product and screw- nut- and b	0.1	0.4	0.8	1.3
245 Metal heat treating	0.0	0.1	0.1	0.2
246 Metal coating and nonprecious engrav	0.0	0.2	0.2	0.4
247 Electroplating- anodizing- and colorin	0.0	0.5	0.5	0.9
248 Metal valve manufacturing	0.0	0.2	0.8	0.9
249 Ball and roller bearing manufacturing	0.0	0.0	0.1	0.1
250 Small arms manufacturing	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2008defl Petrol Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type S

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
251 Other ordnance and accessories manuf	0.0	0.0	0.0	0.0
252 Fabricated pipe and pipe fitting manuf	0.0	0.1	0.3	0.4
253 Industrial pattern manufacturing	0.0	0.0	0.0	0.0
254 Enameled iron and metal sanitary war	0.0	0.0	0.0	0.0
255 Miscellaneous fabricated metal produ	0.0	0.0	0.0	0.0
256 Ammunition manufacturing	0.0	0.0	0.0	0.0
257 Farm machinery and equipment manufa	0.0	0.0	0.2	0.2
258 Lawn and garden equipment manufactu	0.3	0.1	2.5	2.9
259 Construction machinery manufacturin	0.0	0.0	0.1	0.2
260 Mining machinery and equipment manu	0.0	0.0	0.3	0.3
261 Oil and gas field machinery and equi	0.0	0.0	0.0	0.0
262 Sawmill and woodworking machinery	0.1	0.0	0.2	0.3
263 Plastics and rubber industry machiner	0.0	0.0	0.7	0.7
264 Paper industry machinery manufacturi	0.0	0.0	0.1	0.1
265 Textile machinery manufacturing	0.0	0.0	0.1	0.1
266 Printing machinery and equipment man	0.0	0.0	0.3	0.3
267 Food product machinery manufacturin	0.0	0.0	0.3	0.3
268 Semiconductor machinery manufacturi	0.0	0.0	0.0	0.0
269 All other industrial machinery manufa	0.1	0.1	2.3	2.4
270 Office machinery manufacturing	0.0	0.0	0.0	0.0
271 Optical instrument and lens manufactu	0.1	0.0	0.1	0.2
272 Photographic and photocopying equip	0.0	0.0	0.0	0.0
273 Other commercial and service industr	0.0	0.0	2.3	2.3
274 Automatic vending- commercial laund	0.0	0.0	0.0	0.1
275 Air purification equipment manufactur	0.0	0.0	0.0	0.0
276 Industrial and commercial fan and bl	0.0	0.0	0.0	0.0
277 Heating equipment- except warm air f	0.0	0.0	0.0	0.0
278 AC- refrigeration- and forced air heati	0.0	0.0	0.0	0.0
279 Industrial mold manufacturing	0.0	0.0	0.3	0.3
280 Metal cutting machine tool manufactur	0.0	0.0	0.8	0.8
281 Metal forming machine tool manufactu	0.0	0.0	0.0	0.0
282 Special tool- die- jig- and fixture man	0.0	0.1	7.7	7.8
283 Cutting tool and machine tool accesso	0.0	0.1	0.3	0.4
284 Rolling mill and other metalworking m	0.0	0.0	1.5	1.5
285 Turbine and turbine generator set unit	0.0	0.0	0.0	0.0
286 Other engine equipment manufacturin	0.0	0.1	0.2	0.3
287 Speed changers and mechanical power	0.0	0.2	0.7	0.9
288 Pump and pumping equipment manufac	0.0	0.0	0.0	0.0
289 Air and gas compressor manufacturin	0.0	0.0	0.0	0.0
290 Measuring and dispensing pump manuf	0.0	0.0	0.0	0.0
291 Elevator and moving stairway manufac	0.0	0.0	0.1	0.1
292 Conveyor and conveying equipment m	0.0	0.1	1.2	1.3
293 Overhead cranes- hoists- and monorai	0.0	0.0	0.6	0.6
294 Industrial truck- trailer- and stacker m	0.0	0.0	1.5	1.5
295 Power-driven handtool manufacturing	0.2	0.0	0.5	0.7
296 Welding and soldering equipment man	0.0	0.1	11.3	11.4
297 Packaging machinery manufacturing	0.0	0.0	1.4	1.4
298 Industrial process furnace and oven m	0.0	0.0	0.0	0.0
299 Fluid power cylinder and actuator man	0.0	0.0	0.0	0.0
300 Fluid power pump and motor manufact	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2008defl Petrol Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type S

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
301 Scales- balances- and miscellaneous g	0.0	0.1	0.8	1.0
302 Electronic computer manufacturing	0.7	0.0	0.4	1.1
303 Computer storage device manufacturi	0.1	0.2	0.2	0.4
304 Computer terminal manufacturing	0.0	0.1	0.1	0.2
305 Other computer peripheral equipment	0.2	0.0	0.1	0.3
306 Telephone apparatus manufacturing	0.1	0.0	1.8	1.9
307 Broadcast and wireless communicatio	0.1	0.1	0.8	1.0
308 Other communications equipment manu	0.0	0.1	0.3	0.4
309 Audio and video equipment manufactu	0.1	0.0	0.0	0.1
310 Electron tube manufacturing	0.0	0.0	0.0	0.0
311 Semiconductors and related device ma	0.0	0.0	0.0	0.1
312 All other electronic component manufa	0.4	1.0	1.9	3.3
313 Electromedical apparatus manufacturi	0.2	1.1	1.8	3.1
314 Search- detection- and navigation inst	0.0	0.0	0.0	0.0
315 Automatic environmental control manu	0.0	0.0	0.1	0.1
316 Industrial process variable instrument	0.0	0.1	1.3	1.5
317 Totalizing fluid meters and counting d	0.0	0.0	0.0	0.0
318 Electricity and signal testing instrumen	0.0	0.1	0.8	0.8
319 Analytical laboratory instrument manu	0.0	0.0	0.0	0.0
320 Irradiation apparatus manufacturing	0.0	0.1	0.6	0.7
321 Watch- clock- and other measuring and	0.2	0.0	0.2	0.4
322 Software reproducing	0.0	0.1	0.1	0.3
323 Audio and video media reproduction	0.0	0.0	0.0	0.0
324 Magnetic and optical recording media	0.0	0.0	0.0	0.0
325 Electric lamp bulb and part manufactu	0.0	0.0	0.0	0.0
326 Lighting fixture manufacturing	0.0	0.0	0.0	0.0
327 Electric housewares and household fa	0.0	0.0	0.0	0.1
328 Household vacuum cleaner manufactu	1.1	0.0	0.8	1.9
329 Household cooking appliance manufac	0.0	0.0	0.0	0.0
330 Household refrigerator and home free	0.0	0.0	0.0	0.0
331 Household laundry equipment manufac	0.0	0.0	0.0	0.0
332 Other major household appliance manu	0.0	0.0	0.0	0.0
333 Electric power and specialty transfor	0.0	0.0	0.0	0.0
334 Motor and generator manufacturing	0.0	0.1	0.1	0.2
335 Switchgear and switchboard apparatus	0.0	0.2	0.6	0.9
336 Relay and industrial control manufactu	0.0	0.1	0.4	0.5
337 Storage battery manufacturing	0.1	0.0	0.0	0.1
338 Primary battery manufacturing	0.0	0.0	0.0	0.0
339 Fiber optic cable manufacturing	0.0	0.0	0.0	0.0
340 Other communication and energy wire	0.0	0.1	0.2	0.4
341 Wiring device manufacturing	0.0	0.0	0.0	0.1
342 Carbon and graphite product manufact	0.0	0.0	0.0	0.0
343 Miscellaneous electrical equipment m	0.1	0.0	0.5	0.6
344 Automobile and light truck manufactu	5.5	0.0	4.4	10.0
345 Heavy duty truck manufacturing	0.0	0.0	0.0	0.0
346 Motor vehicle body manufacturing	0.0	0.1	0.2	0.3
347 Truck trailer manufacturing	0.0	0.0	1.0	1.0
348 Motor home manufacturing	0.0	0.0	0.0	0.0
349 Travel trailer and camper manufacturi	0.4	0.0	0.2	0.5
350 Motor vehicle parts manufacturing	1.6	3.1	3.3	8.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2008defl Petrol Displace w Refine
Cleveland EV 2008 090908.iap MULTIPLIER: Type S

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
351 Aircraft manufacturing	0.0	0.0	0.0	0.1
352 Aircraft engine and engine parts manu	0.0	0.2	0.7	1.0
353 Other aircraft parts and equipment	0.0	0.0	0.4	0.5
354 Guided missile and space vehicle man	0.0	0.0	0.0	0.0
355 Propulsion units and parts for space v	0.0	0.0	0.0	0.0
356 Railroad rolling stock manufacturing	0.0	0.0	0.0	0.0
357 Ship building and repairing	0.0	0.0	0.0	0.0
358 Boat building	0.0	0.0	0.0	0.1
359 Motorcycle- bicycle- and parts manufa	0.2	0.0	0.1	0.3
360 Military armored vehicles and tank pa	0.0	0.0	0.0	0.0
361 All other transportation equipment ma	0.0	0.0	0.0	0.0
362 Wood kitchen cabinet and countertop	0.8	2.6	6.5	9.9
363 Upholstered household furniture manu	0.4	0.0	0.2	0.6
364 Nonupholstered wood household furni	3.0	0.0	1.2	4.2
365 Metal household furniture manufactur	0.2	0.0	0.1	0.3
366 Institutional furniture manufacturing	0.0	0.0	0.1	0.2
367 Other household and institutional furni	0.0	0.0	0.0	0.1
368 Wood office furniture manufacturing	0.0	0.0	0.4	0.4
369 Custom architectural woodwork and m	0.0	0.0	1.0	1.0
370 Office furniture- except wood- manufa	0.0	0.0	0.1	0.1
371 Showcases- partitions- shelving- and l	0.0	0.1	3.2	3.3
372 Mattress manufacturing	2.3	0.0	1.3	3.6
373 Blind and shade manufacturing	0.6	0.0	0.2	0.8
374 Laboratory apparatus and furniture ma	0.0	0.1	2.0	2.1
375 Surgical and medical instrument manu	0.2	2.9	3.2	6.3
376 Surgical appliance and supplies manuf	2.3	3.4	4.5	10.2
377 Dental equipment and supplies manufa	0.0	1.0	1.1	2.1
378 Ophthalmic goods manufacturing	1.4	0.0	0.5	1.9
379 Dental laboratories	0.0	5.3	1.8	7.2
380 Jewelry and silverware manufacturing	0.5	0.0	0.2	0.7
381 Sporting and athletic goods manufactu	0.1	0.0	0.0	0.1
382 Doll- toy- and game manufacturing	6.0	0.3	2.3	8.6
383 Office supplies- except paper- manufa	0.1	0.0	0.0	0.1
384 Sign manufacturing	0.0	0.4	0.9	1.3
385 Gasket- packing- and sealing device	0.0	0.0	0.0	0.1
386 Musical instrument manufacturing	1.9	0.1	1.1	3.1
387 Broom- brush- and mop manufacturing	0.1	0.0	0.1	0.3
388 Burial casket manufacturing	0.0	0.0	0.0	0.0
389 Buttons- pins- and all other miscella	0.1	0.1	0.1	0.4
390 Wholesale trade	-159.9	5.2	15.6	-139.1
391 Air transportation	4.5	1.0	2.5	7.9
392 Rail transportation	-15.0	7.1	2.5	-5.3
393 Water transportation	-3.8	0.4	1.1	-2.3
394 Truck transportation	-12.1	20.4	44.4	52.7
395 Transit and ground passenger transpor	7.8	1.7	4.7	14.2
396 Pipeline transportation	-2.0	1.8	0.2	0.0
397 Scenic and sightseeing transportation	3.0	-0.6	6.7	9.1
398 Postal service	10.3	21.5	19.6	51.4
399 Couriers and messengers	0.0	8.3	11.3	19.6
400 Warehousing and storage	0.8	2.8	7.9	11.4

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2008defl Petrol Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type S

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
401 Motor vehicle and parts dealers	215.3	4.6	83.5	303.4
402 Furniture and home furnishings stores	55.4	1.4	21.8	78.6
403 Electronics and appliance stores	53.9	1.6	22.9	78.4
404 Building material and garden supply s	127.2	3.2	50.2	180.6
405 Food and beverage stores	309.8	6.6	120.9	437.4
406 Health and personal care stores	114.1	3.0	45.1	162.2
407 Gasoline stations	-2,154.9	1.9	29.4	-2,123.6
408 Clothing and clothing accessories stor	154.6	3.1	59.1	216.8
409 Sporting goods- hobby- book and musi	67.9	1.5	27.2	96.6
410 General merchandise stores	266.7	5.7	102.6	374.9
411 Miscellaneous store retailers	129.5	2.8	50.8	183.1
412 Nonstore retailers	163.5	4.1	63.7	231.4
413 Newspaper publishers	3.2	3.1	5.6	11.9
414 Periodical publishers	1.6	1.0	1.7	4.4
415 Book publishers	1.7	0.4	1.1	3.2
416 Database- directory- and other publish	1.0	1.4	2.1	4.5
417 Software publishers	1.8	0.1	1.3	3.2
418 Motion picture and video industries	5.9	5.3	4.6	15.8
419 Sound recording industries	1.1	0.2	0.4	1.7
420 Radio and television broadcasting	1.3	2.1	2.9	6.3
421 Cable networks and program distribut	0.3	0.0	0.1	0.4
422 Telecommunications	26.8	11.0	18.8	56.6
423 Information services	0.7	0.6	0.7	2.0
424 Data processing services	0.0	1.4	1.5	2.9
425 Nondepository credit intermediation an	20.2	19.0	22.0	61.2
426 Securities- commodity contracts- inve	43.8	53.2	40.1	137.1
427 Insurance carriers	66.8	17.0	32.1	116.0
428 Insurance agencies- brokerages- and r	0.0	33.6	12.8	46.4
429 Funds- trusts- and other financial vehi	19.4	0.4	7.4	27.3
430 Monetary authorities and depository c	66.1	10.6	29.5	106.2
431 Real estate	185.1	144.0	164.3	493.5
432 Automotive equipment rental and leas	11.8	2.4	6.4	20.7
433 Video tape and disc rental	11.7	0.0	4.2	15.9
434 Machinery and equipment rental and l	0.0	1.7	2.0	3.8
435 General and consumer goods rental ex	5.0	1.6	4.5	11.1
436 Lessors of nonfinancial intangible asse	0.0	0.8	0.3	1.1
437 Legal services	50.8	44.7	40.8	136.3
438 Accounting and bookkeeping services	4.1	25.5	24.3	53.9
439 Architectural and engineering services	0.0	22.9	36.7	59.7
440 Specialized design services	0.4	2.9	2.9	6.2
441 Custom computer programming servic	0.1	1.0	41.1	42.3
442 Computer systems design services	0.8	8.5	13.0	22.3
443 Other computer related services- includ	0.3	2.3	3.0	5.5
444 Management consulting services	0.5	18.3	15.6	34.4
445 Environmental and other technical cons	0.0	4.4	3.9	8.3
446 Scientific research and development s	7.8	7.6	11.5	27.0
447 Advertising and related services	0.1	7.2	10.5	17.8
448 Photographic services	7.4	1.3	3.4	12.0
449 Veterinary services	39.2	1.9	14.7	55.8
450 All other miscellaneous professional a	0.0	4.1	2.8	6.9

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2008defl Petrol Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type S

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
451 Management of companies and enterpr	0.0	9.7	21.4	31.1
452 Office administrative services	0.0	9.9	7.3	17.2
453 Facilities support services	0.0	1.2	3.5	4.7
454 Employment services	2.9	112.6	82.6	198.1
455 Business support services	3.8	15.6	11.1	30.6
456 Travel arrangement and reservation se	6.8	2.2	4.0	12.9
457 Investigation and security services	1.9	16.2	27.5	45.6
458 Services to buildings and dwellings	15.2	52.3	42.6	110.1
459 Other support services	0.4	5.0	4.7	10.1
460 Waste management and remediation se	1.5	5.2	5.1	11.8
461 Elementary and secondary schools	106.4	0.0	41.9	148.3
462 Colleges- universities- and junior coll	133.9	4.7	51.6	190.2
463 Other educational services	69.7	6.0	28.5	104.2
464 Home health care services	136.7	0.0	46.6	183.4
465 Offices of physicians- dentists- and ot	457.5	0.0	153.8	611.3
466 Other ambulatory health care services	101.3	7.2	38.0	146.4
467 Hospitals	505.7	0.0	170.4	676.1
468 Nursing and residential care facilities	306.7	0.0	104.5	411.2
469 Child day care services	148.4	0.0	54.3	202.7
470 Social assistance- except child day ca	243.3	0.0	88.6	331.9
471 Performing arts companies	28.3	15.5	16.0	59.8
472 Spectator sports	13.1	4.6	7.2	25.0
473 Independent artists- writers- and perf	0.0	2.3	1.2	3.5
474 Promoters of performing arts and spor	11.0	3.5	5.9	20.4
475 Museums- historical sites- zoos- and	12.8	0.0	4.5	17.3
476 Fitness and recreational sports centers	51.9	2.4	19.8	74.1
477 Bowling centers	8.4	0.6	3.3	12.4
478 Other amusement- gambling- and recrea	101.2	1.0	36.8	139.0
479 Hotels and motels- including casino ho	40.4	12.8	25.9	79.2
480 Other accommodations	4.7	0.0	1.8	6.5
481 Food services and drinking places	871.9	58.9	336.8	1,267.6
482 Car washes	18.0	1.1	7.3	26.4
483 Automotive repair and maintenance- e	86.3	5.4	37.6	129.3
484 Electronic equipment repair and main	0.9	0.8	4.2	5.8
485 Commercial machinery repair and mai	0.0	2.7	3.4	6.2
486 Household goods repair and maintena	4.6	1.2	3.0	8.8
487 Personal care services	97.9	3.1	34.1	135.0
488 Death care services	23.7	0.0	7.2	30.9
489 Drycleaning and laundry services	30.2	9.3	17.5	57.0
490 Other personal services	34.5	0.8	13.4	48.6
491 Religious organizations	18.4	0.0	6.4	24.8
492 Grantmaking and giving and social ad	60.7	0.0	22.1	82.9
493 Civic- social- professional and similar	101.7	41.0	56.1	198.8
494 Private households	208.1	0.0	74.7	282.8
495 Federal electric utilities	0.0	0.0	0.0	0.0
496 Other Federal Government enterprises	0.1	0.2	0.3	0.6
497 State and local government passenger t	12.2	2.6	7.4	22.2
498 State and local government electric uti	83.0	0.9	2.8	86.7
499 Other State and local government ente	36.4	8.6	18.3	63.3
500 Noncomparable imports	0.0	0.0	0.0	0.0

*Number of Jobs

Version:2.0.1025

Report IM020



Employment Impact

September 24, 2008

Copyright MIG 2008

IMPACT NAME: B 2008defl Petrol Displace w Refine
Cleveland EV 2008 090908.iap

MULTIPLIER: Type S

<u>Industry</u>	<u>Direct*</u>	<u>Indirect*</u>	<u>Induced*</u>	<u>Total*</u>
501 Scrap	0.0	0.0	0.0	0.0
502 Used and secondhand goods	0.0	0.0	0.0	0.0
503 State & Local Education	0.0	0.0	482.2	482.2
504 State & Local Non-Education	0.0	0.0	318.4	318.4
505 Federal Military	0.0	0.0	43.3	43.3
506 Federal Non-Military	0.0	0.0	58.6	58.6
507 Rest of the world adjustment to final	0.0	0.0	0.0	0.0
508 Inventory valuation adjustment	0.0	0.0	0.0	0.0
509 Owner-occupied dwellings	0.0	0.0	0.0	0.0
11,001 Federal Government NonDefense	0.0	0.0	0.0	0.0
11,003 Federal Government Investment	0.0	0.0	0.0	0.0
12,001 State/Local Govt NonEducation	0.0	0.0	0.0	0.0
12,003 State/Local Govt Investment	0.0	0.0	0.0	0.0
14,001 Capital	0.0	0.0	0.0	0.0
14,002 Inventory Additions/Deletions	0.0	0.0	0.0	0.0
25,001 Foreign Trade	0.0	0.0	0.0	0.0
28,001 Domestic Trade	0.0	0.0	0.0	0.0
	4,605.9	1,215.0	4,668.1	10,489.1

*Number of Jobs

Version:2.0.1025

Report IM020

